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Foreign and Domestic Pig Iron Costs

Disadvantageous Position of United States in Export Market—Pre-War and Today's Analyses for British, Lorraine and Belgian Furnaces

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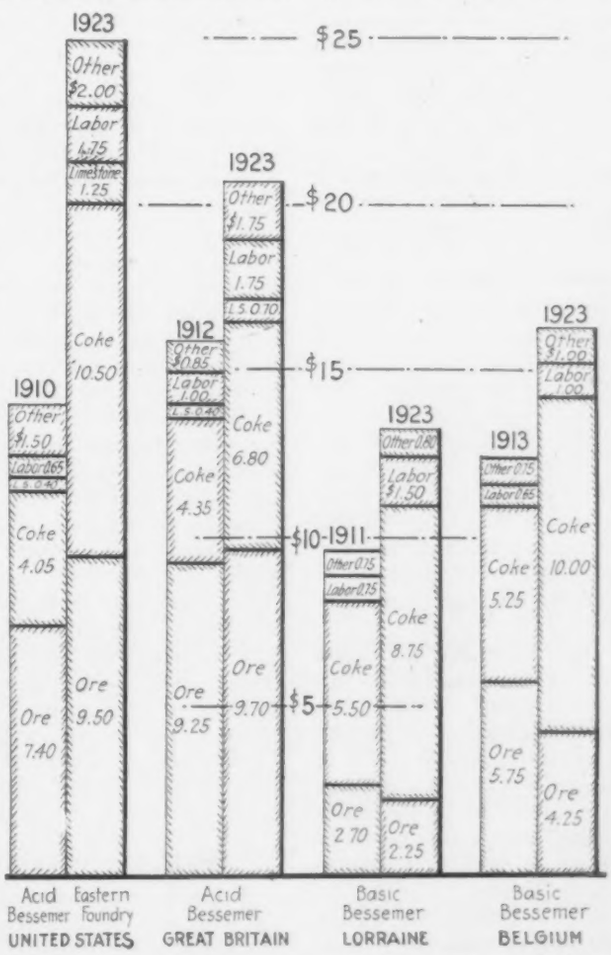
FOR several years there has been a tendency to consider the American steel industry as being supreme not only in technical achievement but also with respect to cheapness of production. This belief was encouraged during the war period and also after the armistice when American steel actually could be sold abroad at lower prices than European steel. As the United States was then able to produce a larger surplus over and above domestic requirements than any other country, the growth of exports was so encouraging that it induced many persons to proclaim exultantly that the iron and steel industry of this country already had become impregnable in its home markets and shortly would also dominate the export field. It has been a little distressing to observe during the last twelve months that British exports have increased largely whereas exports from this country have dwindled very greatly from the high records set during and immediately after the war. Nevertheless, a revival of exports seems to be rather generally expected as soon as the effects of the coal strike wear off and we can again secure the full advantage of the marvelous organizations and the splendid mechanical equipment which American genius has devised to replace human labor.



Present and Pre-War Costs (Per Gross Ton) in Making Pig Iron

It may be of interest, however, to pause from time to time and examine seriously the premises upon which this enthusiasm and confidence in the future is based. Patriotic pride in American achievement may well be condoned and there is no gainsaying the fact that American engineers and American captains of finance have built up an industrial structure that is the envy of the world. Despite progressive reductions in tariff protection, our own markets really have been practically immune from foreign competition in heavy steel products and we have actually exported large tonnages to great advantage. From an annual production of less than four million tons of pig iron and a million and a quarter tons of steel in 1880, the United States, under the stress of war demands, attained an annual output of more than 39 million tons of pig iron and 45 million tons of steel. Whereas, only about 20 years ago, the United States produced scarcely one-third of the world production of iron and steel, it has now demonstrated its ability to make more than all the rest of the world combined and its production during the late years of the war exceeded the output of the entire world in 1900.

These figures are history and, unfortunately, the frenzied buying of American steel which characterized the aftermath of the war—the result of the much exaggerated "world hunger" for steel—has also passed into history. Exports continue, but on a much more modest scale and, for many months, foreign steel has been cheaper than American steel. From time to time, it has actually sold in some quantity in the United States. In only recent months, an extraordinary quantity of pig iron has been imported. Foreign pig iron is so much cheaper than domestic that, even after paying

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the freight and landing charges into this country, it can be sold at prices which the American furnace operators complain bitterly are not remunerative. These and other signs of weakness in our trade should lead us to look soberly into the foundations of this great industry and compare its stability with that of the industries in other great iron-making countries.

Other things being equal, the country that can produce the cheapest pig iron has the advantage over its competitors throughout the whole range of heavy steel products. A successful fine-steel steel industry may be built up on the basis of imported raw materials but it is hard to conceive of a large industry being maintained indefinitely for the production of heavy tonnage products by means of a cold pig process. Even the "rolling for hire" mills in England have had hard sledding when forced to buy their billets on the Continent. While the increased use of scrap is perhaps the most characteristic of recent developments in steel making throughout the world, the economical production of pig iron is still the only permanent foundation for vigorous and stable steel industry.

Owing to the overwhelming importance of the cost of raw materials in the production of pig iron, the country that produces pig iron most successfully in competition with its foreign rivals must be able to assemble coke, ore, and fluxes of suitable quality at its furnaces more cheaply than these elements can be assembled at rival stacks. While other factors, such as proper mechanical equipment, labor supply, and, especially, distance from markets, are of vital importance, they can seldom offset any material disadvantages with respect to the cost of raw materials delivered at the top of the furnaces. The logical thing, therefore, is first to examine into the relative advantages in this country and in Europe as regards supply of these essentials and then to compare the present situation with that which existed during former periods when the American steel industry was expanding rapidly.

American Equipment Not Always Superior to Foreign

As compared with England, France and Germany, the United States has larger reserves of ore and, as a class, American ores have a higher average iron content than ores in the other countries specified. We have also the greatest bituminous coal reserves in the world and these reserves include a satisfactory proportion of excellent coking coal. Our main disadvantages are (1) the remoteness of the ore fields from the principal coal areas, which necessitates long hauls on fuel or ore, or both, before they can be brought together, and (2) the cost of railroad shipment of products to markets located generally hundreds and sometimes thousands of miles away.

These huge distances, while they are a serious handicap in some respects, are of advantage to the domestic industry in that they constitute an almost insurmountable obstacle to the importation of foreign iron and steel into interior markets, freight rates in this instance yielding all the benefits of a highly protective customs tariff. On the other hand, the continental proportions of the United States also result in leaving the Pacific Coast markets peculiarly vulnerable and, in some cases, enable Europe to enjoy the advantage of ocean freight rates to parts of the Atlantic seaboard, which are much cheaper than the cost of rail shipment to these points from domestic furnaces.

At the present time, for example, the average transatlantic freight rate on heavy iron and steel is 15s. or $3.50 a ton, whereas the freight from Pittsburgh to Philadelphia is $7.25 per gross ton and from Pittsburgh to Boston, $8.15 per gross ton. These discrepancies are only partly offset by the various additional expenses incidental to the importation of foreign iron, as these rarely amount to more than $1.50 per ton. Except for these fringes of coast, however, imported iron and steel are at a disadvantage and it can be easily demonstrated that geographical protection affords the domestic industry greater security from foreign competition in its home markets than is accorded the industries of any other country. This security, strengthened in the earlier days of the industry, perhaps, by protective tariffs, goes far to explain the confidence which inspired the investment of the enormous amount of capital necessary to provide the equipment and modern facilities for production which so largely offset the higher labor rates that have always obtained in the United States.

This country was the pioneer in the introduction of labor saving devices and in increasing furnace capacities to the most economical limits (and beyond). Whereas in the earlier years—and to a considerable extent at the present time—the use of superior equipment in this country results in lower labor costs on account of the greater output per man employed, this condition can not be expected to be maintained indefinitely. Such virtue as follows the integration of production and the full employment of labor saving devices is fully recognized abroad. In fact, it seems that many foreign metallurgists are prone to exaggerate the importance of equipment and go farther in their emulation of modern (which means American) methods than their own peculiar local conditions really warrant.

The situation existing before the war has now altered materially and there has been a tremendous amount of integration throughout Europe. While the United States was the first country to produce consolidations on a huge scale, she has by no means had a monopoly of this factor in reducing costs and in effecting operating and administrative economies. The advantages of large units and of complete control of all stages of production from ores to finished steel has been preached from one end of Europe to the other, and now there are a score of companies in England and on the Continent that control their supplies and facilities throughout. Some of the newer crop of consolidations are even more highly integrated than the United States Steel Corporation in that their activities extend far beyond the accepted boundaries of steel production and into the manufacture of tools, machinery, and other highly fabricated articles.

With a watchful eye on developments in this country, many foreign firms have spent large sums in remodeling and modernizing their plants and in England especially, although also on the Continent, the new construction has been quite as up-to-date in design and plant layout as any found in this country. While antiquated and inefficient plants are still contributing to the outputs of all European countries, the old generalizations as to equipment are no longer to be accepted as axiomatic now that Europe has invested her war profits and injected new capital into improvements. Tendencies point strongly toward a greater parity between European and American operating efficiencies.

This brings us back to a consideration of the comparative costs of ore, coke, and limestone in the chief producing regions of the world.

British Ore Costs Almost Back to Normal

From the standpoint of world trade in iron, it will suffice to consider the Middlesbrough district as typical of the whole United Kingdom. This is by far the largest producing district and is the one best suited geographically for carrying on export trade in iron and steel. As in other parts of the United Kingdom, both local and imported ores are used in this region, but the gradual exhaustion of many of the nearby mines, combined with the high cost of fuel after the war, has tended toward a greater dependence upon imported ore, which, as it is richer in iron, requires less fuel and allows a larger output to be obtained from the same stacks.

The typical ore, therefore, is *Rubio*, which is a Spanish hematite containing approximately 50 per cent of iron. In January, 1923, this ore cost 22s. per ton ex-ship Tees (river points) which price includes the freight of about 8s. from Bilbao and, for works located on tidewater, represents the total cost of ore delivered at the plants. Taking into account exchange, the present price is equivalent to only about $5.10 per ton, whereas in 1913, the price of 20s. was equivalent to $4.87 per ton. It may be noted at this point that this is by no means the cheapest ore in England, as Swedish and African ores are also imported, and there are many developments, notably in Lincolnshire, using the local Jurassic ores, low grade material, of which we may hear even more during the next few years.

But even taking the Spanish ore as representative, it will be seen that British ore costs are back almost to the same figures that obtained before the war and, furthermore, that this price delivered at the furnaces, or within a few short miles of them, compares favorably per unit of iron content with the present market prices of ore at lower lake ports of the United States.

Going back still further, we find that in 1900-01, Spanish ore cost 15 to 16s. per ton delivered at Middlesbrough, including a freight of 5s. Assuming that this ore averages 50 per cent of iron and that 95 units are needed to produce one ton of pig iron, it is evident that the ore cost per ton of product, using this ore, has increased in more than 20 years only from $7.18 to $9.70. When compared with the price immediately prior to the war, the difference is actually less than the increase in the ocean freight rate which is now 8s. per ton as compared with 4s. or 5s. before the war.

Some of Britain's Ore Opportunities

While in the Cleveland district local ores are scarcer and more costly to produce than they were a decade ago, new developments during and since the war in other sections of England have more than offset the gradual depletion in the older district. Whereas Spanish ore is taken as the barometer of the situation, it should be constantly kept in mind that there are a great number of British firms that mine their own ores locally, and a few of them, using steam shovel methods, undoubtedly secure their ore at the furnaces at a cost that does not exceed one penny per unit of iron contained.

In some particulars, the English situation resembles the conditions as to local ore supply in Virginia but with the important difference that the use of native ores has really only started and, eventually, developments similar to those in Alabama may be expected. There are enormous resources of these phosphoric ores in England, resembling, in quality and occurrence, those of Lorraine, although even lower grade. The importance of these deposits has been recognized only in late years and their exploitation has been delayed greatly by the abnormal fuel costs which obtained immediately after the war. There is already the basis, however, for several large and successful undertakings and, as soon as fuel costs are definitely reestablished upon a reasonable level, England should begin to reap rich rewards from the development of a basic steel industry utilizing these ores.

The bitter and unreasonable prejudice against the use of basic steel which has persisted in British engineering circles is gradually being dispelled and, at least in the opinion of the writer, who has given some study to the situation, the early expansion of her basic steel production from these low grade but remarkably cheap native ores is Britain's trump card in the international iron and steel trade.

British Advantage in Fuel Supply

At the moment, Great Britain is the most favorably situated of all nations as regards fuel supply. Even ignoring all consideration of political disturbances and labor and transportation conditions, British mines can undoubtedly produce coal much more cheaply than those in any other iron making district in Europe, with the possible exception of the Ruhr. While under normal conditions it is not likely that the cost of coal at the mines in Wales or England will be as low as the cost of mining coal from the thicker seams found in the United States, the fact that British coal and coke almost never have to be carried more than negligible distances from the mines and ovens to the blast furnaces and steel works does much toward equalizing fuel costs in the iron and steel industries of the two countries.

Although British coke prices mounted to over 60s per ton at the ovens during the 1920 boom, it should be recognized that, taking exchange into account, this peak quotation was only $12.50 to $13 actually delivered at the blast furnaces. Furthermore, since British prices are per gross ton, the price in 1920 was equivalent to only $11 per net ton, the basis of coal prices in the United States.

Following the settlement of the coal strike in the latter part of 1921, the British coal industry seriously got down to work. Whereas, immediately after the strike, prices were drastically reduced to the point where they did not yield the operators any return on their investment, the miners' earnings, under the terms of the agreement were also cut to a point where the men had difficulty in making both ends meet. This agreement was an experiment in national economics that was made possible only by the fact that unemployment was so general in England at the time that the miners were practically confronted with the alternative of coming back to work on some such basis as this wherein they share the hardships as well as the profits of the industry or of remaining on strike until they starved.

Under this agreement production has been increasing steadily and costs have been progressively reduced. At the beginning of the experiment, the coal price was arbitrarily established in each district at what it was thought it ought to be in order to dispose of the output although, in many districts, this price was very much below what had been the cost of production just prior to the strike. While both miners and operators suffered a little hardship at first, the results have proved satisfactory. Although fuel is now one of the cheapest things in England today as, judged on the scale of increased cost of other commodities, the selling prices now show some margin above costs and miners' wages are but little lower than those of other workers in England. Actually, owing to the fact that full time employment is offered them, the coal miners have enjoyed larger earnings than other British workers who insisted upon a nominally higher minimum wage.

All of this discussion leads to the conclusion that the British fuel situation is relatively sound and while prices may be advanced temporarily in response to such extraordinary demands as might result from a long cessation of production in the Ruhr or because of an abnormal expansion in home consumption, the whole structure of costs, production, and prices in Great Britain is comparatively stable.

British Coke Prices

Early in January, 1923, Durham coke was quoted at 30 to 31s. per gross ton delivered at works In the Middlesbrough district. Allowing for exchange and using the ton of 2000 lb. so as to make comparisons with American prices, the Cleveland furnace operators are now paying roughly $6.30 per ton for their coke delivered at their works at the same time that Connellsville and Pocahontas coke is quoted around $9 a ton and more at the ovens and hard to get.

The present British price is materially higher than that of six months ago owing to the increased demand from the iron trade and, as converted into U. S. currency, due to the steady improvement in sterling exchange. During the summer of 1922, Durham coke reached its lowest price since the war, selling for a time at 23s. 6d. at the ovens or around 26s. delivered at the works in the Middlesbrough district. Comparing this price with prewar days, we find that this same grade of coke delivered at the works cost on the average about 18s. per ton in the first six months of 1914 and 21s. 6d. per gross ton during 1913. Twenty odd years ago, however, Durham coke was sold in the district at 14s. and less per ton delivered at the furnaces.

Durham is the best furnace coke in England and one of the best in the world. Coke of good quality is, however, produced in many other parts of Great Britain and these other kinds of coke are extensively employed in making iron. All of them are cheaper than Durham coke. In the Midlands, a good grade of furnace coke now costs 23s. per long ton or less than $4.80 per 2000 lb.

Since only 2100 lb. of coke are required to make a ton of pig iron from Spanish ore, the present fuel cost at Middlesbrough, using Durham coke, is only $6.80 per ton of product.

Limestone now costs about 5s. 9d. per ton as compared with 3s. 4d. before the war. On the assumption that Spanish ore requires exactly one-half ton of this flux, the cost per ton of pig iron produced figures out as less than 70 cents at the present time as compared with 40 cents before the war.

Labor Costs Per Ton of Iron Made

Despite the contemptuous feeling which many American metallurgists have toward British furnace equipment and the slower rates of driving generally in vogue over there, it must be admitted that labor and general charges in Great Britain are not so very much higher than they are in this country. Despite the lower wages, direct labor cost is usually higher than it is in this country but cheaper relining and renewals, interest charges based upon a smaller investment, and cheaper supplies tend pretty much to balance matters.

Whereas the labor cost alone in the production of pig iron was at least 16s. per ton on the average in the latter part of 1919 and early 1920 when British wages were at almost their highest level, the writer's observations lead him to the conclusion that at the present time 15s. or $3.50 per ton would be a generous allowance for labor and general charges of all kinds; although there are antiquated furnaces where just the wages cost is more than this figure.

The British iron and steel industry is fortunate in having an agreement whereby wages are automatically raised or lowered in accordance with the prices of the products. In the Cleveland district blast furnacemen's wages were only 24 per cent above standard in January, 1923, whereas two years previous they stood at more than 170 per cent above the basis rates. At present common labor receives only about 40s. a week in Cleveland and the average blast furnace employee earns approximately 9s. or $2.10 a day although two years ago he was getting 20s. or about $4 a day at current exchange.

The average weekly earnings of all employees in the British iron and steel industry were only £2 17s. 8d. in December, 1922, whereas in 1920 this average, which nominally represents 56 hr. work, was £5 7s. 11d. The range in wages actually represents a change from affluence to poverty for the employees, yet it was effected without any friction whatsoever. In fact, by friendly negotiation a year ago, the blast furnacemen accepted a drastic cut in anticipation of the automatic operation of the sliding scale, thereby enabling British prices to be slashed so as to compete in the world's markets. This intelligent cooperation of the workers was an effective aid to the success of British export trade last year and the men benefited correspondingly in the form of increased employment.

The data presented in the above discussion of British conditions may be assembled in the form of an estimate of the total cost of making hematite (acid bessemer) pig iron in England at present and before the war. The figures are as follows:

Cost of Making Hematite Iron in Great Britain (Cleveland)

	Pre-war	Present
Ore	$9.25	$9.70
Coke	4.35	6.80
Limestone	0.40	0.70
Other charges	1.85	3.50
Total	$15.85	$20.70

It is also of interest to compare the above figures with the costs for 1903-4 as presented to the (British) Tariff Commission by the late J. Stephens Jeans, at that time secretary of the British Iron Trade Association, and which were published as part of the testimony before that commission:

British Pig Iron Costs in 1903-4

	Cleveland Foundry Iron	Hematite Iron (West Coast)
Ore	$3.89	$6.20
Coke	3.89	5.11
Limestone	0.37	0.32
Wages at furnace	0.91	0.97
Bricks, clay and boiler coal	0.18	0.16
Fixed charges, including relining and repairs	0.55	0.57
Stores, loose plant, etc.	0.18	0.14
Total	$9.97	$13.47

In the body of the report, Mr. Jeans stated that the cost of producing hematite iron in the Cleveland district would be about 5s. per ton less than on the West Coast, which gives a cost of 50s. 5d. or about $12.25 per ton to be compared with the above estimate of $20.70 per ton at the present time, the increase in almost 20 years being nearly 70 per cent as compared with only 30 per cent advance over the cost immediately prior to the war. The reader should also bear in mind that the present situation is actually somewhat better than the above comparisons indicate on the basis of using 100 per cent Spanish ores since the British industry is offered North African and Swedish ores at prices that permit more favorable costs while the prospect of more general employment of cheap native ore constitutes a sturdy reserve power for the British industry to fall back upon.

Another factor that must not be lost sight of when comparing British cost with American is that many of the British furnaces are actually at the seaboard and, since there is often no railroad freight whatever to pay on export orders, the difference between plant costs and f.o.b. costs is practically nil.

(To be continued)

Standard Thicknesses of Sheet Metal

Letter circular 24, one of the mimeographed circulars of the Bureau of Standards, Washington, has just been issued and gives standard thicknesses of sheet metals including steel plate in sheets, galvanized sheets, copper, brass, aluminum, tin and terne, zinc and monel metal. The various sheet metal and wire gages used in designating the thicknesses are also discussed. The circular is a collection into useful form of information that has heretofore been widely scattered and inaccessible. A limited number of copies of this circular may be obtained from the bureau.

Resumption of operations at the plant of the Pittsburgh Tin Plate & Steel Corporation, Marietta, Ohio, is contemplated at an early date, according to A. V. Somers, vice-president and general manager. The corporation is being refinanced through the medium of a bond issue now before the public.

CENSUS OF BLAST FURNACES

Products in 1921 Little Over Half the 1919 Value, but Higher Than in 1914, Though Tonnage Was Lower

WASHINGTON, Feb. 8.—According to figures for the 1921 census, there was a considerable reduction since the 1919 census in the number of blast furnace establishments in operation, in the number of persons engaged in the industry, in their compensation and in the value of product. The figures shown in Table I indicate that the number of persons engaged fell off by more than 50 per cent, while the value of products decreased 47.2 per cent. Due to higher average prices, however, the value of products in 1921 was 31.1 per cent above 1914, although the number of establishments, number of persons engaged and tonnage produced were much greater in 1914 than in 1921.

Pennsylvania and Ohio were far in the lead in number of active establishments in 1921, having respectively 42 and 30, or together more than half of the 134 total. These States, however, were also far in the lead in the number of idle establishments, having respectively 22 and 16 of the 73 which were idle during the entire year. Other active establishments included 13 in Alabama, 9 in Michigan, 8 in New York, 6 in Illinois, 4 each in Tennessee and Virginia, 3 each in Indiana, West Virginia and Wisconsin, 2 each in Missouri and New Jersey, and one each in Colorado, Kentucky, Maryland, Massachusetts and Minnesota. Idle establishments, aside from those mentioned above, included 8 each in Alabama and Virginia, 6 in Tennessee, 3 in Kentucky, 2 in Michigan and one each in Connecticut, Maryland, Minnesota, Missouri, New Jersey, New York, Texas, and West Virginia.

There was considerable fluctuation in the monthly employment of wage earners in 1921. In January, the month of maximum employment, 30,818 wage earners were reported, and in August, the month of minimum employment, 13,913, the minimum representing 45.1 per cent of the maximum. The average number employed during the year was 18,968, as compared with 41,660 in 1919, a reduction of 54.5 per cent.

The returns indicate that the combined output of all establishments was only approximately 40 per cent of the maximum capacity, based upon a demand requiring full running time. The statistics for 1921, 1919 and 1914 are summarized in Table I, those for 1914 being added to show pre-war conditions; the figures for 1921 are preliminary and subject to such change and correction as may be necessary from further examination of the original reports.

Table I—Comparison of 1921 Results With 1919 and 1914

	1921	1919	1914
Number of establishments	134	195	160
Persons engaged	23,219	46,956	33,194
Proprietors and firm members	7	41	15
Salaried employees	4,244	5,255	3,823
Wage earners (average number)	18,968	41,660	29,356
Salaries and wages	$40,633,400	$87,204,400	$28,895,200
Salaries	11,263,700	13,435,000	6,114,600
Wages	29,369,700	73,769,400	22,780,600
Contract work	547,700	692,300	265,100
Cost of materials	361,049,500	621,286,500	264,580,000
Value of products	419,771,200	794,466,600	317,654,000
Value added by manufacture (Value of products less cost of materials.)	58,721,700	173,180,100	53,074,000

Detailed statistics of production for the years 1921 and 1919 are given in Table II. The 1921 figures include the blast furnace ferroalloys, ferromanganese, spiegeleisen, etc., which are not included in the pig iron figures for 1919. The pig iron and ferroalloy production of the blast furnaces in 1921 aggregated 16,618,493 gross tons, valued at $408,581,500, comparable with a production of 30,861,918 gross tons, valued at $812,639,000, in 1919; 23,269,731 gross tons, valued at $312,761,617, in 1914; and 25,651,798 gross tons, valued at $387,830,443, in 1909. The figures show an average unit value, for all pig iron, including the ferroalloys, of $25.59 per gross ton in 1921; $26.33 in 1919; $13.44 in 1914, and $15.12 in 1909.

Table II—Details of Output of Pig Iron and Ferroalloys in 1921, Compared with 1919.

	1921 Gross Tons	1921 Value	1919 Gross Tons	1919 Value
Total value of products	.....	$419,771,200	.....	*$801,062,300
Pig iron and ferroalloys, total	16,618,493	408,581,500	†30,543,167	†785,960,400
For consumption in works of company producing	12,776,218	307,519,900	21,687,376	523,533,000
For sale	3,852,275	101,061,600	8,855,791	262,427,400
All other products	.....	11,189,700	.....	15,101,900
Pig iron and ferroalloys by fuel used:				
Coke, total	16,494,176	404,504,100	30,097,220	770,101,200
For consumption	12,749,605	306,935,200	21,686,861	523,505,900
For sale	3,744,571	97,568,900	8,410,359	246,595,300
Charcoal	93,767	3,050,600	315,737	11,498,100
Other fuel	30,550	1,026,800	130,210	4,361,100
Pig iron by grades, total	16,436,377	.....	30,543,167	.....
Basic	7,411,403	.....	14,597,535	.....
Bessemer	5,723,361	.....	9,374,950	.....
Foundry	2,613,332	.....	4,792,961	.....
Malleable	330,875	.....	1,090,344	.....
Low phosphorus	201,731	.....	289,726	.....
Forge or mill	111,221	.....	287,529	.....
White, mottled and miscellaneous	25,637	.....	56,418	.....
Direct castings	18,817	.....	53,704	.....
Ferroalloys, total	182,116	.....	‡318,751	.....
Ferromanganese	103,717	.....	180,444	.....
Spiegeleisen	50,750	.....	81,010	.....
Ferrosilicon	22,170	.....	53,516	.....
Ferrophosphorus	5,479	.....	3,781	.....
Delivered molten to steel works	8,884,764	.....	18,138,453	.....
Machine cast	5,773,618	.....	7,746,656	.....
Sand cast	1,781,902	.....	3,970,309	.....
Chill cast	159,392	.....	634,045	.....
Direct castings	18,817	.....	53,704	.....

*Includes $6,595,800 pig iron products made by establishments primarily engaged in other lines of manufacture.
†Ferroalloys made in blast furnaces in 1919 were not included in this industry.
‡Blast furnace ferroalloys included in the ferroalloy industry (1919) and not included above.

Stagnation of the 1921 merchant iron market is shown by the fact that the producers consumed in their own works 76.8 per cent of the production in 1921, against 71 per cent in 1919. The production by coke constituted 99.3 per cent of the total in 1921, and 98.5 per cent in 1919. Charcoal iron in 1921 was 93,767 tons (0.6 per cent), valued at $3,050,600, as compared with 315,737 tons (1.03 per cent), valued at $11,498,100 in 1919, a decrease of 70.3 per cent in tonnage, and 73.5 per cent in value.

Of the pig iron, considered by grades, basic constituted 45.1 per cent of the total; Bessemer, 34.8 per cent; foundry, 15.9 per cent and all other, 4.2 per cent. Ferromanganese and spiegeleisen constituted 84.8 per cent of the blast furnace alloys in 1921; 82 per cent in 1919

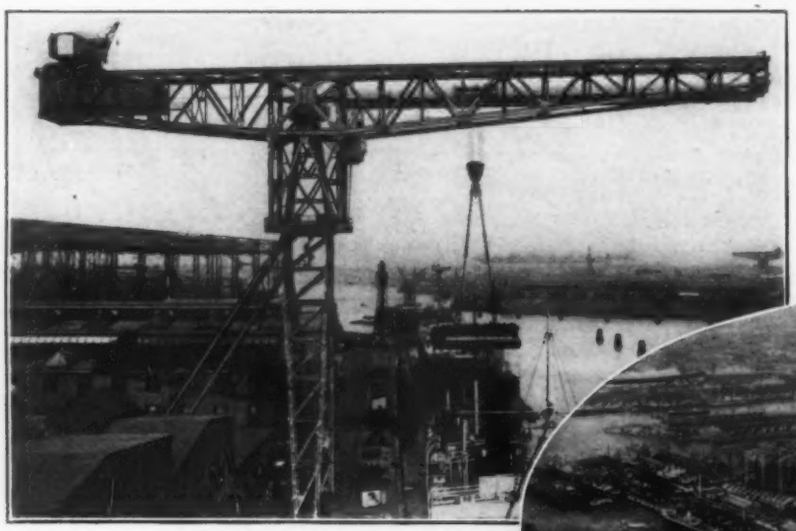
Present Plight of German Shipbuilding

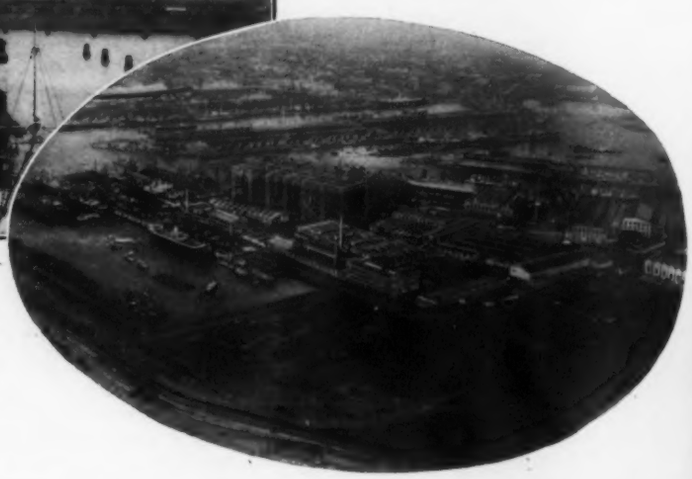
What General Economic Situation and Ruhr Siege Have Done—Rejuvenating Ships and Locomotives Chief Activity —Machine Equipment Essentially Old

BY CAPT. GODFREY L. CARDEN*

HAMBURG at the beginning of the world war was the first shipbuilding port in Germany. The Vulkan Works, Blohm & Voss and the Deutsche Werke represented the latest in shipbuilding installations. The combined facilities of these yards are today unexcelled by any other port in the world, those yards which turned out such ships as the Leviathan, Majestic and Berengaria, but there is now an almost entire absence of ship construction.

The Vulkan yards are typical of the best in the shipbuilding line in Germany. I visited this establishment Jan. 17 and traversed both shops and yards. No vessels were on the building ways, but there was considerable repair work in hand. Among the vessels receiving attention was a United States Shipping Board steamer.





At the Left a Diesel Engine Being Loaded into Ship by Means of 250-ton Crane of the Vulkan Plant at Hamburg

Below Airplane View of the Hamburg Works

In pre-war days Vulkan employed at the Hamburg yards as many as 10,000 men. The present number on the pay rolls is about 5000. In the harbor was lying a fine new steamer, the Antonio Delfino, built for the South American service of the Hamburg-American line. This is one of the best vessels built by Vulkan. She is the largest built in Germany since the war, and was designed with the idea of giving the greatest possible comfort and luxury in travel at the minimum of expense in operation. This last was effected through reduction in speed. We see therefore the latest idea in trans-oceanic service, a luxuriously fitted up passenger steamer carrying a total of 1850 passengers in all classes, and 9000 tons of cargo. The speed for normal steaming is fixed at 13 knots, although it is possible to secure a maximum of 16 knots. Vulkan's system of oil-burning is installed, the ship bunkers six tanks for a total of 3000 tons of oil. There are two triple-expansion engines of 5800 hp. total rating.

The Antonio Delfino is a striking example of German effort under adverse economic conditions. The lack of money is described as the greatest handicap. The shipyards are also prevented from undertaking vessels of importance, it is said, because of the fear that they may be claimed for reparation. As a consequence all new construction is for the most part of minor character.

The Vulkan establishment maintains shipyards at both Hamburg and Stettin. It was in one or the other of those two yards that many steamers familiar to the American public were built. In some cases hulls were constructed at Stettin and engines in the Hamburg shops. In the list are such well-known craft as the former express steamers Kaiser Wilhelm II, Kronprinzessin Cecilie (renamed Mount Vernon) and the Imperator, now named the Berengaria. Vulkan attained the peak in shipbuilding work in Germany, and its docks became world famous. No craft, no marine installation of any kind was too big to undertake, and with this activity went a correspondingly high grade of technical designing and supervision. The engineers of Vulkan counted as their alma mater the first technical schools of Germany.

Shipbuilding Now Marking Time

Today Vulkan impresses the visitor as marking time endeavoring under adverse conditions to hold together an organization, and looking forward to a better time ahead. But the situation was represented to me as being very serious, especially with the occupation of the Ruhr. The German shipyards drew on the Ruhr and on Upper Silesia for ship material. The major portion came from the Ruhr. Upper Silesia is now

*The author will be recalled for contributions in THE IRON AGE of Dec. 7 and Dec. 21 of last year and Jan. 4, 1923, dealing with changed industrial conditions in Poland and Germany. He is now again in Europe and the accompanying article is the first of a series of intimate observations coming from him on the situation abroad in metal-working fields.

Scale of Locomotive Manufacturing at Hamburg of the Vulkan Works

Polish territory and the Ruhr is occupied by the French. What may be expected from the Ruhr under the circumstances, the shipbuilding officials do not know. It is certain that they can make no prognostications as to deliveries when there is no certainty as to what may come, if any, from the Ruhr, and by the term Ruhr is included, of course, the steel products of the Westphalian and Rhine mills. The Ruhr, it must be appreciated, is the nerve center of German industries.

With the Ruhr open, the shipyards were able to go ahead. Cargo steamers were being turned out at approximately £10 per ton and passenger steamers for £12 to £13 per ton. Fabricated ships after the manner instituted in the United States were seldom undertaken, and only in cases of vessels of small dimensions. Financing was here a difficulty.

The yards found a vast amount of repair work offered them. Vessels which would not serve for reparation were made available for service. Many of their

Erecting Shop for Marine Diesel Engines of the Vulkan Works at Hamburg, Germany

craft in pre-war days would have been discarded. Practically nothing new has been developed in shipbuilding work. Experimentation costs money, and money is not available.

Getting into Locomotive Work

Right now Vulkan is keeping a number of its shops busy in repairing locomotives. It has long maintained both at Hamburg and Stettin locomotive departments at the shipyards. Several thousand locomotives were exacted of Germany by the Allies, and it was to be expected that only the best would be taken.

This left to the German State railways a large number of engines which in normal times would go to the scrap heap. Not so now! Long lines of these hard-driven engines have been drawn up at the Vulkan yards, and in due course one engine after another enters the shops, passes down the line, and emerges in a very much rejuvenated and fit-to-work shape. It is illuminating to watch what the Vulkan men are doing with a lot of those fit for scrap engines. As a matter of fact the frames of most machines are in fair shape, but practically all piping has to be renewed. The steel working parts are very much used up, and the boilers likewise. Copper fire boxes were the rule before the war, but copper is now only used in new construction. One cannot help being impressed, in observing the work on these old German locomotives, with the intensity of the Germans in their efforts to economize in all things and to make the best of the present situation. Approximately 100 locomotives were under repair at the time of the visit.

No machine tool installation at the Vulkan Hamburg shops is essentially modern. There are many special tools in use and Vulkan has evolved its own design of tools for turning down propeller blades.

Wages

The present rate of wages paid is practically the same throughout without regard to ratings. Work is limited to 48 hr. per week, and the average rate of wage to machine men and outside men alike is 500 marks per hour. At this writing (Jan. 18) exchange is being paid in Hamburg at the rate of 26,000 marks for $1 U. S. currency.

Vulkan lost many of its skilled men during the war. The situation in this respect was no different at the machine tool plants. The armies at the last had to draw on the industries.

The Vulkan plant at Hamburg covers 286,000 square meters, of which 90,000 sq. m. are occupied by shops. The Stettin plant covers 320,000 sq. m. The shop area at Hamburg is greater than that at Stettin. The main offices are at the Hamburg yards. Stettin has four metal and six wooden shipbuilding ways, and Hamburg four metal ways. The Hamburg yards have one 200-ton swinging crane and one 100-ton floating crane. The Hamburg yards possess four floating docks of 6000, 9500, 17,500 and 25,000 tons lifting capacity respectively. The Stettin yards were founded in 1857 and the Hamburg yards in 1905.

The Blohm & Voss yards turned out 97 U-boats during the war. This plant built the Vaterland and Bismarck, now the Leviathan and Majestic respectively, and the battle cruisers Moltke, Goeben, Seydlitz and Derflinger.

When working at full capacity the Blohm & Voss yards employ 14,000 men. This plant possesses highly modern equipment, which includes a 250-ton swinging crane, the largest of which we have any knowledge. The Majestic was taken out of water by two floating docks of this establishment. This same ship was taken to Boston for docking recently, as no dock existed in England of sufficient size for the work.

The Blohm & Voss plant covers 580,000 sq. m.; shops and other buildings cover 270,000 sq. m. and the water basin within the yards covers at high tide 40,000 sq. yd.

The situation at these yards is a duplicate of conditions at Vulkan. No new construction, and an organization reduced fully 50 per cent. Here also wages are practically the same, but for that matter, it is explained, the workmen with their socialistic ideas are largely to blame, demanding equal pay for the skilled and unskilled. Deliveries of ship material is very uncertain, and there is practically nothing new in shipbuilding ideas since the war. Lack of money, it is summed up, accounts for the doldrum conditions which prevail, not only here but throughout the German shipyards. With the Ruhr source of supply in question, the shipbuilding works regard with great anxiety the coming months.

Plans of American Institute of Steel Construction

The American Institute of Steel Construction announces that its membership has been developed to a point where it is possible to carry on its future work with assurance of success. A committee of highly qualified talent has been organized to recommend unit stresses, column formula and specification for superstructure. This committee consists of the following men: Prof. George F. Swain, consulting engineer, past president of the American Society of Civil Engineers, and professor of engineering of Harvard University; Prof. Milo S. Ketchum, dean of the College of Engineering, University of Illinois; E. R. Graham, of the architectural firm of Graham, Anderson, Probst & White, Chicago; W. J. Thomas, chief engineer of the architectural firm of Geo. B. Post & Sons, New York; Wilbur J. Watson, president of the Watson Engineering Co., Cleveland.

At a recent meeting of this committee, a draft was made of a tentative specification covering the design, manufacture and erection of structural steel for buildings. The individual members of this committee are now making a separate study of this specification to assure themselves that the entire field has been properly covered in such a way as to assure its acceptance by all the interests concerned. L. H. Miller, Leader-News Building, Cleveland, is managing director of the association.

Building Activity Continues

January building construction was 31 per cent greater than in January of 1921, according to F. W. Dodge Co. Contracts awarded in the 36 eastern States amounted to $242,755,000. Comparing the record of 27 of these States with the same States last year, the increase over December is 1 per cent and over January, 31 per cent. More than half of the January total was residential building. Industrial buildings accounted for $23,152,000, or just under 10 per cent of the total.

To Dismantle Blast Furnace

Henry Potts & Co. of Philadelphia, have purchased from the Pottstown Iron Co. the blast furnace plant at the Lower Works, Pottstown, Pa., and will start the dismantling of the entire plant in a few days.

Having already made Edgar Thomson works, Carnegie Steel Co., the safest iron and steel plant of its size in the world, safety directors of that plant, under the direction of O. H. J. Hartsuff, general superintendent, have started to spread the gospel of safety to the community in which the plant is located. In connection with a series of safety lectures, being given in the Carnegie Library Auditorium, Braddock, Pa., is a contest among the school children of that district, with prizes to be given for the best essays on safety subjects

Annual Dinner of Philadelphia "Iron Mongers"

The first "annual symposium" of the Tubal Cain Chapter, Iron Mongers' Association, an organization of Philadelphia pig iron men, was held at the Hotel Adelphia, Philadelphia, Friday evening, Feb. 9. "The memorandum of mixtures," in other words the menu, was cleverly gotten up in "blast furnace lingo" and included such items as "fruit supreme, charged by skip car and mixed with McKee revolving top," and "rugere breast guinea hen, sauté Virginia pig, sow shot with mud gun in hog wallow, and broiled on Greenawalt pan." It wound up with "demi tasse, hot, fluid and gray, served in side dump cars," "low sulphur cigars," and "high volatile cigarettes." The guest of honor was W. Brooke Meanley of the Jones Hollow Ware Co., Baltimore, who had presented the organization a golf cup cast in iron, which was awarded to Walter B. Kennedy, district sales agent of the Bethlehem Steel Co. Other guests were E. C. Kreutzberg of the *Iron Trade Review* and C. E. Wright of THE IRON AGE.

Robert C. Lea is iron master of the chapter; Richard Peters, Jr., is head founder; H. F. Hallman, keeper; W. A. Barrows 3rd, paymaster, and George P. Pilling, clerk. Other members are: J. C. Agnew, V. W. Aubel, F. L. Ballard, W. A. Barrows, Jr., R. S. Battieger, Felton Bent, R. E. Blazo, Robert E. Brooke, Harry D. Carson, A. A. Corey, Harry C. Crawford, Henry C. Du Bois, W. W. Hearne, E. L. Harndon, Percival Johnson, Frank W. Jones, Walter B. Kennedy, Chesley S. Ker, W. S. Lippincott, John W. Logan, Charles E. Loxley, J. E. McCauley, R. H. McCurdy, F. W. Marshall, M. B. Meanley, G. K. Mohr, N. L. Moon, C. H. Newcomb, Laird U. Park, Waldo L. Phillips, J. Ross Pilling, Radcliffe Romeyn, Robert Smith, Donald Spackman, H. B. Spackman, John R. Sproul, George R. Sullivan, R. M. Taylor, Dexter Tutein, Harry Uphouse, Howard Wood, Jr., W. A. Worth. The banquet committee consisted of John R. Sproul and Percival Johnson and the executive officers.

National Safety Congress to Be Held at Buffalo in October

The National Safety Council has accepted the invitation of the Buffalo Chamber of Commerce to hold the 1923 National Safety Congress at Buffalo, Oct. 1 to 5, according to announcement by W. H. Cameron, managing director, for the executive committee of the council.

The convention will be held in the new Buffalo Statler Hotel, which will be completed in April. Because of the increasing importance of the national problem of accident prevention, particularly in respect to public accidents, this year's congress is expected to be the best attended in the history of organized safety. Over 3000 delegates gathered at the 1922 safety convention at Detroit last August.

Buffalo was one of the pioneer districts in the development of industrial safety and has more recently achieved noteworthy accomplishments in curbing public accidents.

Annual Banquet of Providence Engineering Society

The Providence Engineering Society held its seventh annual banquet Wednesday evening, Feb. 7, at the Biltmore Hotel, Providence, R. I. More than 600 members and guests attended. The guests included Governor Flynn of Connecticut, Mayor Gainer, ex-Governor James Hartness, Vermont, Dr. Samuel W. Stratton, president Massachusetts Institute of Technology, and Robert H. Newcomb, Malden, Mass. James C. Hall, president of the society, presided. Frederick C. Freeman, vice-president, served as toastmaster.

Mr. Hartness spoke on the engineer in public service, declaring the world never before faced such a condition as now. He outlined the work of the various engineering sciences and their parts in the development of the country and of industry, and stated the entire fabric is now being tested.

"We must now give thought to the protection of the country and the home," he said. "We must bend every effort to correct such things as tend to deprive all of an equal opportunity. Laws cannot keep pace with the advancement of machinery. There are things about the Government that are not right, but business must not be interrupted. To interrupt transportation will starve the people in the towns and work havoc with the men on the farms. We must make it clear that interruption of transportation is bad and will reduce the wages of both labor and capital."

John Ericsson Society Enlarging

The Capt. John Ericsson Memorial Society of Engineers, which formerly was restricted to Swedish engineers in the United States, has changed its by-laws to admit American engineers. The association grew out of a meeting on March 31, 1907, at the Engineers Club in New York at which time some 30 Swedish engineers determined on an organization for perpetuating the memory of Capt. John Ericsson, best known of course as the builder of the Monitor with its revolving gun turret. The society has met on Nov. 23 every year to celebrate the day that John Ericson, landed in New York and twice it has had a dinner on March 9, celebrating the day on which the Monitor won the victory over the Merrimac. The society now has a membership of 142.

Two-Day Foundry Convention

The Wisconsin Foundrymen's Association is cooperating with the University of Wisconsin in the solution of foundry problems, and will have a two-day convention in Madison on April 4 and 5, which promises to be very interesting to all foundrymen and a large attendance is expected, not only from the State of Wisconsin, but from surrounding States.

Convention of National Metal Trades Association

The National Metal Trades Association will hold its 25th annual convention at Hotel Astor, New York, April 16 to 19 inclusive. On April 16 and 17 there will be meetings of the local branch secretaries, the executive committee, and the administrative council. The convention proper will open on April 18 and continue through a session on Thursday morning, April 19. The convention banquet will occur the evening of April 18. The addresses at the convention will cover such subjects as industrial training, finance, the political situation as it affects business, immigration and legislation.

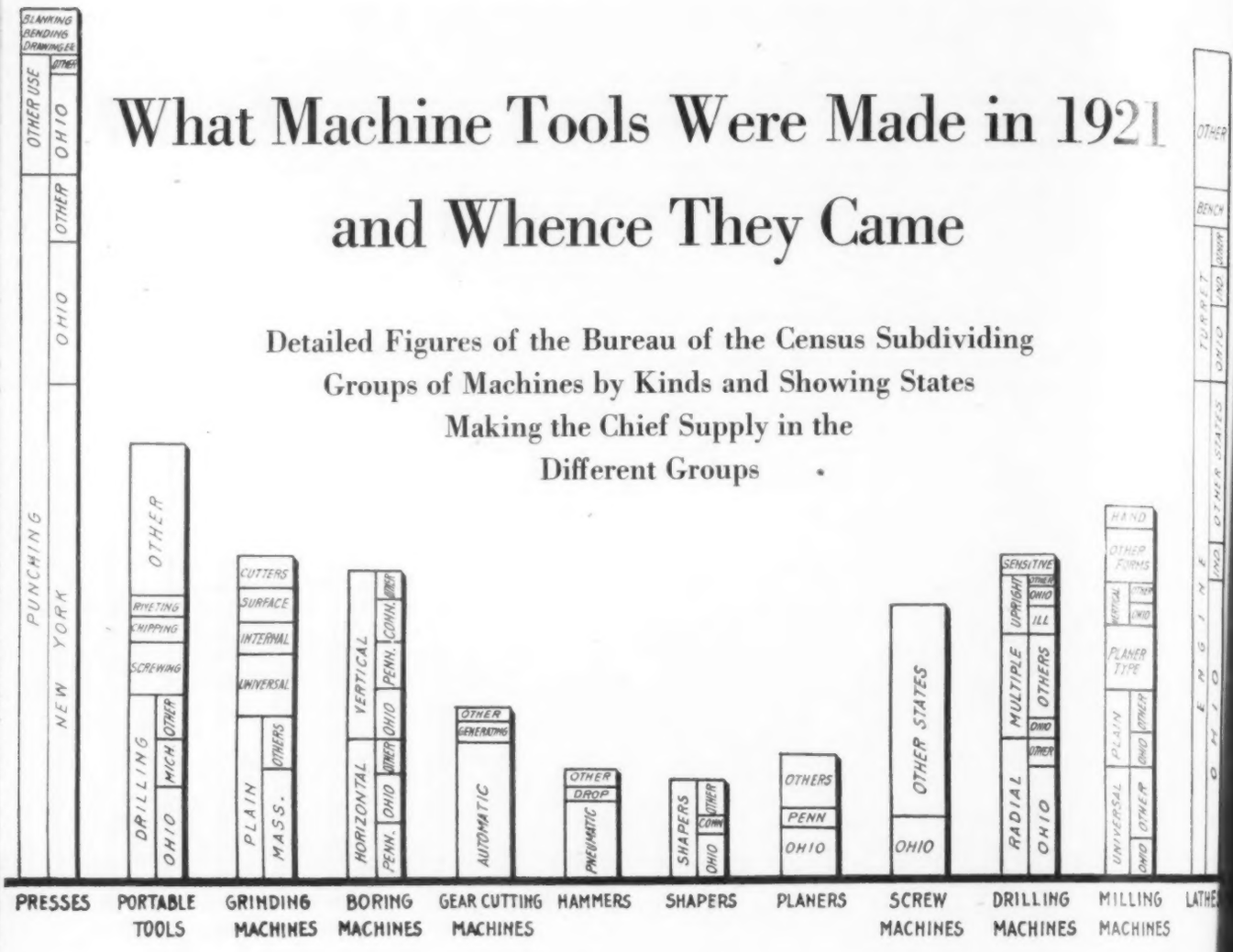
The sixth meeting of the Quad City Foundrymen's Association will be held at the Harms Hotel, Rock Island, Ill., Monday, Feb. 19, at 6.45 p. m. W. A. Gregg, foundry superintendent of the Whiting Corporation, Harvey, Ill., will discuss Cupola Practice and Cupola Construction for Gray Iron Foundries. Mr. Gregg is a metallurgist and he has had many years of practical experience in the operation and construction of cupolas.

On Feb. 12, E. E. Thum, associate editor *Chemical and Metallurgical Engineering*, addressed the members of the Cincinnati Chapter, American Society for Steel Treating, taking as his subject, "Educating the Metallurgist and the Management." At the March meeting, T. G. Selleck, Chicago, will talk on "Carburizing."

The availability of zinc as a roofing material for use on farm buildings is being investigated by the Mississippi Valley experiment station of the Bureau of Mines.

What Machine Tools Were Made in 1921 and Whence They Came

Detailed Figures of the Bureau of the Census Subdividing Groups of Machines by Kinds and Showing States Making the Chief Supply in the Different Groups



OHIO was conspicuous in the production of machine tools in 1921, according to statistics compiled by the Bureau of the Census. The share of that State was 28.6 per cent on the basis of value. Ohio, New York and Rhode Island accounted for over one-half. An accompanying table and a circular chart gives the participation of the States securing most of the business.

In THE IRON AGE of Feb. 1, page 336, were given the preliminary statistics, showing that the total of machine tool manufactures, as so designated by the Census Bureau, was less than one-third in value the total production of 1919. The figures in added detail are tabulated below and a circular chart shows the relative importance in money value of the different classes of machines made and the chart at the head of this article pictures the information in detail while retaining by means of the heights of the columns the same relative money values. It has been said that the machine tool trade booked orders early in 1920 at a rate somewhere near $50,000,000 per month, so that 1921, with $5,640,000 ($67,730,000 ÷ 12) per month in

What Percentages Different Classes of Machine Tools Contributed to the 1921 Production

What Percentages of Machine Tools Made in 1921 Different States Supplied

new manufactures and if only 10 per cent of orders shipped out of the stocks of 1920, represented a volume of business hardly one-eighth that of the first months of 1920.

Following are the census figures:

Value of Machine Tools Produced by Different States in 1921

State	Value
Ohio	$19,399,794
New York	8,952,833
Rhode Island	6,410,844
Pennsylvania	5,927,283
Connecticut	5,418,035
Illinois	4,670,337
Massachusetts	3,588,172
Michigan	3,004,750
Wisconsin	2,399,939
Indiana	2,291,277
New Jersey	2,197,488
Vermont	1,611,440
All other States	1,857,171
Total value	$67,729,363

Machine Tool Production in 1921 by Value and Quantity

State and Kind	Number	Value
Bending machines	54	$164,315
Boring machines:		
Horizontal	632	1,340,106
Pennsylvania	304	554,976
Ohio	58	478,289
All other States	270	306,841
Vertical	266	1,840,792
Ohio	100	590,711
Pennsylvania	44	489,847
Connecticut	93	472,621
All other States	29	287,613
Broaching machines	530	616,933
Drilling machines:		
Multiple spindle	676	1,106,097
Ohio	42	199,151
Michigan	35	58,086
All other States	599	848,860
Radial	722	1,360,233
Ohio	613	1,103,349
All other States	109	256,884
Sensitive	1,428	227,601
Ohio	283	36,969
All other States	1,145	190,632
Upright	1,677	603,156
Illinois	932	295,925
Ohio	324	217,553
All other States	421	89,678
Gear-cutting machines:		
Automatic	656	1,445,672
Disk type	32	70,047
Generating type	146	182,524
Other	6	38,424
Grinding machines:		
Cylindrical—		
Plain	1,789	1,666,101
Massachusetts	627	1,144,842
All other States	1,162	521,259
Universal	692	656,184
Michigan	83	78,296
Massachusetts	15	21,600
All other States	594	556,288
Surface	271	337,620
Massachusetts	93	147,290
Connecticut	20	100,126
All other States	158	90,204
Cutter, tool and knife	435	319,396
Massachusetts	129	78,369
Ohio	80	73,759
Connecticut	71	53,201
All other States	155	114,067
Internal	276	345,029
Other	208	69,136
Wisconsin	179	50,996
Connecticut	14	10,453
All other States	15	7,687
Hammers:		
Drop	502	120,139
Pneumatic	2,607	814,394
Ohio	594	83,938
All other States	2,013	730,456
Other	541	179,171
Lathes:		
Engine	5,117	5,229,884
Ohio	2,060	3,112,191
Indiana	1,346	396,707
New York	381	277,739
Massachusetts	106	229,471
Illinois	350	226,578
Pennsylvania	67	56,892
All other States	807	930,306
Bench	1,095	393,112
Massachusetts	305	131,852
Illinois	423	123,946
Connecticut	56	21,995
All other States	311	115,319
Turret	1,077	1,580,842
Ohio	594	786,014
Indiana	237	394,612
All other States	246	400,216
Other	333	1,440,017
Milling machines:		
Hand feed	468	233,945
Connecticut	324	120,643
All other States	144	113,302
Power feed—		
Plain	536	812,346
Ohio	232	361,116
All other States	304	451,230
Universal	594	1,092,234
Ohio	220	364,939
All other States	374	727,295
Vertical	212	415,275
Ohio	110	243,600
All other States	102	171,675

Machine Tools—1921 (Continued)

State and Kind	Number	Value
Milling machines, continued:		
Lincoln type	32	$32,997
Planer type	173	696,685
Other	258	539,776
Ohio	36	40,125
All other States	222	499,651
Pipe machines	1,192	570,509
Ohio	631	349,497
All other States	561	221,012
Planers	194	1,271,824
Ohio	95	542,113
Pennsylvania	27	154,662
All other States	72	575,049
Portable tools:		
Drilling	20,809	1,886,978
Ohio	5,814	956,918
Michigan	10,557	453,560
All other States	4,438	476,500
Calking	28,000	14,100
Chipping	309,584	269,552
Hammering	1,947	64,589
Riveting	2,663	215,811
Screwing	67,321	541,232
Other	2,127	1,488,349
Presses:		
Bending	165	102,900
Blanking	711	318,329
Drawing	8	19,007
Hydraulic	1	4,658
Punching	20,045	7,284,166
New York	14,325	5,147,848
Ohio	3,716	1,467,893
Wisconsin	185	67,936
All other States	1,819	600,489
Other	2,898	1,198,350
Ohio	2,781	1,035,919
Pennsylvania	43	50,671
All other States	74	111,760
Screw machines	2,661	2,839,667
Ohio	560	609,435
All other States	2,101	2,230,232
Shapers	1,418	1,020,342
Ohio	822	485,770
Connecticut	256	156,597
Pennsylvania	6	16,250
All other States	334	361,725
Shears	3,347	906,722
Ohio	289	229,711
Wisconsin	50	105,038
Illinois	24	42,852
All other States	2,984	529,121
All other machine tools	....	5,486,336
Connecticut	....	1,256,578
Ohio	....	702,922
Pennsylvania	....	407,719
New York	....	176,934
Illinois	....	101,344
Missouri	....	100,696
Michigan	....	95,268
Massachusetts	....	63,854
All other States	....	2,581,021
Parts and attachments	....	8,936,547
Ohio	....	2,708,096
Illinois	....	1,247,501
Connecticut	....	1,086,349
Wisconsin	....	687,557
Vermont	....	646,195
Pennsylvania	....	595,166
New York	....	528,222
Massachusetts	....	371,009
New Jersey	....	322,133
Michigan	....	305,799
Rhode Island	....	176,069
All other States	....	262,451
All other products	....	7,319,212

Etching Reagents for Alloy Steels

Considerable attention was paid recently to the problem of finding an etching reagent by which chromium carbide could be distinguished from vanadium carbide in a positive and satisfactory manner. Only one out of about 20 of the reagents tried seemed likely to be of much use in this connection. This is a hot solution of potassium permanganate and sodium hydroxide, etching in which for one minute darkens chromium carbide to a strong brown-red or brown color, or rather, the carbon is eaten out giving the walls of the cavity thus formed a dark brown-red color, while vanadium carbide remains uncolored and apparently unattacked.

Another but less positive means of distinction is that obtained by electrolytic etching with a weak current in a dilute aqueous solution of ammonia or sodium hydroxide. The chromium carbide is eaten out leaving a dark brown-red or brown cavity, while the vanadium carbide is eaten out apparently at a slower rate leaving cavities which appear light and not at all darkened.

The Struthers Furnace Co., New York, a merchant iron interest operating a stack at Struthers, Mahoning county, announces that January production established a new monthly record. Some time ago the stack was rebuilt, enlarged and modernized.

GREAT POWER PROJECT

Quebec Development Co. Organized with $25,000,000 Subscribed—Extensive Plans

TORONTO, Feb. 12.—The Quebec Development Co., Quebec, Que., has been incorporated for the purposes of financing and developing the large power resources of Lake St. John and the Saguenay River, in the Province of Quebec. The project will necessitate the building of several dams. A diversion dam will be built at the Petite Discharge from Lake St. John to prevent discharge from that outlet, and the first development will be made at the beginning of the main outlet from the lake. A dam will be built there, from Ile Maligne to North shore, and the power plant will be located on the mainland just below the dam. The dam will also comprise a long spillway section along the south side of the island and another section across to the south shore. The great length of the spillway section, about 3000 ft., is necessary to discharge freely the tremendous volume of water coming from Lake St. John and tributaries in flood season. It is stated that this dam will be about 100 ft. high. According to present estimates, 400,000 hp. will be produced at this first development, and preliminary installation of 12 generating units of 35,000 hp. each is contemplated.

A second development further down the river is proposed for the future. At this point 22 miles from the lake, the river drops directly to tidewater and it is estimated that 800,000 hp. will be available in this later undertaking. The development at this point will comprise a dam 200 ft. high, built across a narrow section of the Saguenay, just above the mouth of the Shipshaw River. From there the water will be conveyed by penstock to the power house located on the bank of the Shipshaw. It is estimated that this power house will be able to use double the head obtainable by the upper plant.

Sir William Price, of Price Brothers & Co., Ltd., and James B. Duke, president Southern Power Co., have subscribed the capital stock of the company amounting to $25,000,000. The engineering of the development is in charge of W. S. Lee, chief engineer Southern Power Co. H. L. Brown is chief contractor as well as vice-president, and J. M. McCarthy is also named as one of the officials of the Quebec Development Co. W. J. Bishop, Montreal, Que., is acting in the capacity of consulting engineer. Price Brothers & Co. have contracted for 200,000 hp. from the first plant for use in their paper mills.

Slight Increase in Stocks of Coal and By-Product Coke

WASHINGTON, Feb. 13.—Complete reports received by the Bureau of Census and the Geological Survey and compiled under authority of the Federal Fuel Distributer, show that by-product coke plants on Jan. 1 had an average of 19 days' supply of bituminous coal, while steel works had an average of 27 days. These averages compare with 18 days and 21 days respectively on Nov. 1, last. During the last quarter of 1922, five days' supply was added to stocks at by-product plants and 10 days' supply was added at steel works. Of the supply at by-product plants on Jan. 1, there was an average of 14 days of low volatile and 20 days' supply of high volatile coal, while of the stocks at steel works, there was an average of 24 days' supply of steam coal and 30 days' supply of gas coal.

Stocks of unsold coke at by-product coke plants decreased to such an extent that the quantity on hand represented only a normal working supply. Against a stock of 870,000 tons on March 1, 1922, the same plants had 228,000 tons on Nov. 1, and 212,000 tons on Jan. 1.

On Jan. 1, commercial consumers had in storage approximately 36,000,000 tons of soft coal. This was 10,000,000 tons more than the revised figure of stocks on Oct. 1, 1922, and 4,000,000 tons more than on Nov. 1. Despite this increase, however, stocks were considerably below those on the first day of preceding years for which records are available. Measured in tons, stocks were 39 per cent larger than on Oct. 1. Measured in terms of days' supply the increase was but 24 per cent, owing to the increased rate of consumption in November and December. Had stocks been evenly divided among all consumers, the supply on Jan. 1 would have lasted 26 days. The stocks on the corresponding date a year ago were sufficient to last 41 days, on Jan. 1, 1921, 30 days, and on Jan. 1, 1919, 42 days. Since the first week in January, the trend in the rate of production has been downward, but the total output during the month was in excess of consumption and stocks increased.

American Surface Abrasives Export Corporation Formed

Papers have been filed with the Federal Trade Commission by the American Surface Abrasives Export Corporation under the export trade act (Webb-Pomerene law) for the purpose of exporting abrasive goods and materials.

The corporation, organized in New York, comprises 10 member concerns in the States of New York, Pennsylvania, Illinois, Massachusetts, Minnesota and Wisconsin. The officers are: President, L. S. Greenleaf; vice-president, E. C. Wright; secretary and treasurer, J. S. Frazee.

The members are Herman Behr & Co., Brooklyn; Armour Sand Paper Works, Chicago; H. H. Barton & Sons Co., Philadelphia; U. S. Sand Paper Co., Williamsport, Pa.; Manning Abrasive Co., Troy, N. Y.; Minnesota Mining & Mfg. Co., Troy, N. Y.; American Glue Co., Boston; the Carborundum Co., Niagara Falls, N. Y.; Wausau Abrasives Co., Wausau, Wis.; Baeder Adamson Co., Philadelphia.

Natural abrasives (mill and oilstones, pumice, emery, garnet, etc.) were produced in 1921 in 26 States. The total value of domestic abrasive materials exported from the United States for the year 1921 amounted to $3,320,590.

While a very substantial business is done in these lines in Canada, the chief concern of the manufacturers interested in the new company is the European, African and South American trade where the distribution of American made abrasives has been generally in the hands of European agents. The chief competition has been of English origin, although in certain grades of very fine finishing papers the American mills produced such a superior product as to create a persistent demand abroad, even to the exclusion of competitive foreign papers.

The purpose of the new export corporation will be to promote and enlarge foreign trade and to insure the cooperation of European agencies on all lines.

Tennessee Company Terminates Lease

BIRMINGHAM, ALA., Feb. 12.—The Tennessee Coal, Iron & Railroad Co. has issued notice that, effective Jan. 1, the Fairfield Steel Co. terminated the lease of its car plant to the Chickasaw Shipbuilding & Car Co. and leased the plant to the Tennessee company. Hereafter the plants of the Fairfield Steel Co., which are leased and operated by the Tennessee company, will be officially designated as the Fairfield Coke Works, Fairfield Steel Works and Fairfield Car Works. The Tennessee company's new merchant bar mill will come in during March, it is hoped.

To Install More De Lavaud Machines

BIRMINGHAM, ALA., Feb. 12.—The United States Cast Iron Pipe & Foundry Co. will install five more De Lavaud machines in the Birmingham plant. The four now operative have a daily capacity of 600 lengths, or 7200 ft. The manufacture of both the sand-cast and the De Lavaud methods will be shown in the Hotel Tutwiler Feb. 16. The De Lavaud pipe has proved a great success. Sizes now made run from 6 to 12 in.

Contends Economic Forces Rule Prices

Steel Corporation Cites Production Figures and Price Comparisons to Show That Prices Are Naturally Fixed at Center of Surplus Supply

CHICAGO, Feb. 10.—The hearings in the Pittsburgh basing point case which have been in progress in Chicago during the past fortnight have brought out testimony covering a wide range of apparently heterogeneous facts and figures. Exhibits have been introduced and witnesses have been examined and cross-examined, but inasmuch as the issues of the case are not now being argued, it is left to the bystander to interpret the purpose of the evidence offered. Thus far the Steel Corporation has offered three exhibits of Illinois Steel Co. invoices and contracts, all of which have been previously mentioned in IRON AGE reports of the hearing. The prices governing these sales were compared with the Pittsburgh base prices as published in THE IRON AGE for the apparent purpose of showing differences between the two and thereby to substantiate the claim that prices charged in the Chicago district were at all times governed by competition and were ever responsive to variations in the relationship of supply and demand. According to the corporation's own counsel, the purpose of the exhibits is to show that at different times the Illinois Steel Co. sells at various prices, which are the market prices at the time of sale.

"Iron Age" Quotations

Obviously it would be impossible to show that the Illinois Steel Co. did not at all times obtain the Pittsburgh base price plus the freight unless there were some standard or ruling price which could be referred to for purposes of comparison The comparisons, therefore, cannot, under any possible interpretation, be considered as intended to discredit THE IRON AGE quotations. On the contrary, they constitute a notable recognition of THE IRON AGE prices as indicating ruling market levels. It is to be remembered that THE IRON AGE prices at Pittsburgh reflect the market in that center whereas the issues in this case have to do only with prices charged by Chicago mills, which may or may not have equaled the Pittsburgh prices plus the freight to destination. It is also to be noted that in no case do the summaries of the three exhibits show the extent of the deviations from IRON AGE prices in terms of dollars and cents. All invoices or contracts which show a deviation, even though it should be a fraction of a cent per hundred pounds, are grouped together, while those which show an exact adherence to IRON AGE quotations form the remaining group.

The objections to the exhibits raised by the attorneys for the commission likewise were not directed against IRON AGE prices, but the methods used by the corporation in making comparisons with those prices. The first exhibit covered 748 invoices taken from the years 1900 to 1921 inclusive. These were compared with IRON AGE prices both as of the date of the invoice and the date of the shipment. One of the principal objections raised to this exhibit was that the comparison was not as of the date of sale. There is nothing on the face of the invoices to indicate whether they covered miscellaneous sales or specifications against contracts. Obviously the dates of specifications might be far removed from the date of the signing of the contract. Even in the case of miscellaneous sales, the date of the invoice would not be identical with the date of the sale. The deviations in price shown by the comparisons are not actually deviations from IRON AGE prices as of the dates of sale, the commission attorneys emphasized in their objection. This exhibit as well as the succeeding exhibits were admitted, although Examiner J. W. Bennett commented that in a regular court of the law the objections would be sufficient to exclude them. The practice in this case, however, is to admit all exhibits and to take note of the objections filed.

Various Exhibits

The second exhibit covered all contracts except those covering export and carbuilders' business for the years 1908, 1910, 1911, 1912, 1914 and 1915. One of the principal objections to this exhibit was the fact that contracts often call for deliveries over long periods and therefore the prices covering the contracts could not fairly be compared with IRON AGE prices which indicate the market on material for 30-day delivery. It was also objected that the exhibit included contracts with concrete bar dealers and others who always bought on a Chicago rather than a Pittsburgh base and contracts with farm implement and railroad specialty manufacturers and others who habitually were granted concessions under the general market. It was also objected that the contract date was not identified as the actual date of sale.

In the case of the third exhibit as well, the objection was raised that the corporation failed to base its comparisons on dates which could be positively identified as the dates of sale. This exhibit, which was briefly referred to in THE IRON AGE of Feb. 8, consisted of over 1600 invoices of the Illinois Steel Co., taken from the years 1908, 1910, 1911, 1912, 1914 and 1915, which were compared with the Pittsburgh base quotations published in the next preceding IRON AGE, both as of date of sale and date of shipment. For the dates of sale the corporation referred to sales record cards which showed the dates of the receipt of purchase orders from customers. The invoices were represented as having been selected at random from the company's files of each month in the years covered.

In commenting on the exhibit, Examiner Bennett said that the outstanding question was whether such a limited percentage of the total number of invoices could be regarded as fairly representative for the purpose intended. In an ordinary court of law, he asserted, a much larger percentage would be required. The exhibit, like the others, was admitted and note was taken of the objections.

W. W. Corlett, counsel for the Steel Corporation, raised certain objections to the statement of the commission attorneys, and particularly to the representation of the testimony of the corporation witnesses which he asserted was unfair.

President Buffington's Testimony

The hearings at the offices of the Federal Trade Commission were continued throughout the week until Friday noon, Feb. 9, when adjournment was taken until Feb. 13. Among the witnesses who were put on the stand both E. J. Buffington, president Illinois Steel Co., and Edwin S. Mills, general sales manager, made reference to trade paper quotations. Under cross-examination, Mr. Mills stated that his company sometimes took business for future delivery at prices to be fixed at time of shipment. When asked how these prices for future delivery were determined, he replied that the trade depended on the weekly quotations on the composite price pages (evidently referring to "Comparison of Prices" in THE IRON AGE and similar departments in other papers) of the generally recognized trade journals.

Mr. Buffington under direct examination stated that trade paper prices are approximately correct but do not at all times report the lowest prices made.

Both Mr. Buffington and Mr. Mills testified to the

wide fluctuations in demand for steel. In the words of Mr. Mills, it is "at times a feast and then again a famine." They likewise agreed as to the impossibility of making steel in advance to meet future requirements. Mr. Buffington explained that this would not be practicable because it cannot be determined in advance what character or size of product will be in demand. Demand for steel depends upon the immediate needs of customers. It is also to be noted that steel products are bulky and would require a wide area for storage.

A large part of Mr. Buffington's testimony was devoted to a review of the growth of the Illinois Steel Co. and changes in market conditions during the past 25 years. At the time of the formation of the U. S. Steel Corporation, he said, the Illinois Steel Co. had no structural mill, but it became the selling agent for the Carnegie Steel Co. and sold structural shapes and other products which it did not roll as well as its own steel. These were sold at a delivered price which depended on the market—usually equivalent to the Pittsburgh base price plus the freight to destination. In fact, the company had the advantage of location in mind when it decided to construct a structural mill at South Works. This was built in 1906.

In reviewing the competition encountered between the years 1901 and 1908, Mr. Buffington pointed out that while there were a few small bar mills in the Chicago district the principal competition was from mills in the territory surrounding and including Pittsburgh. There was no local plate competition and none in structural shapes except for a small tonnage of light structural shapes rolled by the Inland Steel Co. Prices were determined by what competitors were quoting and what customers were willing to pay and usually prices were approximately the same as the Pittsburgh prices plus the freight.

Reason for Building Gary Plant

It was the advantage of location which led to the construction of the Gary plant of the Indiana Steel Co., he said. The erection of the works was recommended by a committee of which he was a member, which, after reviewing the demand in the Chicago district, estimated that production at that time fell short of consumption by nearly 2,000,000 tons annually.

During the period of 1908 to 1920 there was a very material increase in capacity in nearly all plants in the Chicago district, particularly during the war period. The capacity of the Gary plant as first completed was 1,500,000 tons of ingots annually. Today it is approximately 3,000,000 tons. The Inland Steel Co. also nearly doubled its capacity and the Steel & Tube Co. of America plant at Indiana Harbor has been built within comparatively recent years. This plant expansion was due to a very material increase in consumption in the Chicago district as well as to the war demand.

In 1921 demand slackened and competition became very severe. Prices dropped very materially until in the latter half of the year the prices at Chicago closely approximated those ruling at Pittsburgh. Today Chicago prices are from $2 to $3 a ton higher than those at Pittsburgh.

Purpose of Mr. Buffington's Examination

Mr. Buffington's testimony throughout was evidently intended to sustain the view that prices in the Chicago district were at all times determined by the free play of supply and demand. In the earlier years he pointed out that Chicago's capacity was relatively small, too small one would infer, to prevent prices from being determined at the point of surplus supply, i.e. Pittsburgh. As Chicago capacity increased, demand likewise increased, becoming particularly heavy during the war years and in 1920. With the sharp decline in demand in 1921, the Chicago supply became ample to supply the needs of the territory and the difference between Chicago and Pittsburgh prices disappeared. With the increase in demand in 1922, prices advanced, but not sufficiently to equal the ruling Pittsburgh prices plus the freight to Chicago.

The report of the committee which recommended the construction of the Gary works was offered in evidence by the corporation. Objection was raised by the commission attorneys on the grounds that the estimate of the deficiency of supply as related to demand was purely speculative.

Under cross-examination, Mr. Buffington was asked what estimate the committee had made on the deficiency of rail production in the Chicago district when it was decided to build a rail mill at Gary. He replied, 450,000 tons annually. He was then asked how rails were sold and stated that the practice was to bill them f.o.b. mill. Apparently the purpose of the commission's counsel in bringing up this point was to show that in the case of rails at any rate the deficiency in supply did not dictate a price equal to the Pittsburgh price plus the freight to Chicago. Mr. Buffington also replied in the affirmative when asked whether the committee had considered the Pacific Coast as a part of its territory when estimating the demand tributary to Chicago. He responded in the negative when asked whether the coast was so considered now, explaining that there is a freight barrier.

With reference to prices, Mr. Buffington stated that prior to 1917 no protections were granted except to carbuilders. He also asserted that his company never asked premiums for early delivery but had a single price and filled orders in the rotation in which they were received so far as possible. At present, he said, the company is booked six months ahead and is losing some business because it cannot make the deliveries desired by customers. He cited a recent example of a customer who bought from an Eastern mill at from $2 to $3 a ton higher than the Illinois Steel Co. price because he desired earlier shipment than could be promised. In 1920 customers frequently paid premiums to other mills to get early deliveries, he said. Mr. Buffington admitted that the fact that the price of his company at times represent extended deliveries might account for deviations from IRON AGE quotations which, counsel for the commission pointed out, cover 30-day deliveries, as testified to by A. I. Findley, the editor, at Washington.

Mr. Mills' Cross-Examination

Under cross-examination, Mr. Mills testified that from 10 to 11 per cent of the plates, shapes and bars of the Illinois Steel Co. are sold east of a line drawn north and south through, but not including, Chicago. Approximately 4 per cent of the company's output, or about 100,000 tons a year, is shipped to Michigan points. This consists largely of bands for the manufacture of automobile wheels. About 22 per cent of the company's production is sold at concessions if carbuilders are included, and only 4 per cent, excluding carbuilders. These concessions are granted to secure a tonnage backlog. This business is in large individual tonnages of attractive specifications. There are many duplications in sections and sizes which enable a mill to run for a day or longer without changing rolls. In the case of some billet orders, mills are able to run a whole week without roll changes. Mr. Mills stated that the company's business on the Pacific Coast is now practically nil because of the low water rates from the Atlantic through the canal enjoyed by Eastern competitors.

Only 2½ to 3 per cent of the company's tonnage goes to agricultural implement makers and less than 4 per cent to fabricators, Mr. Mills testified.

Although there was no express statement to that effect, one would infer that the reason the commission's counsel made inquiry as to the trade of the Illinois Steel Co. east of Chicago, was to show that in the past at any rate part of the advantage in location was sacrificed to secure business where the freight rate from Pittsburgh was less than from Pittsburgh to Chicago. In other words, notwithstanding the testimony that the Chicago mills produced less than the consumption in Chicago and west of that city, business was not confined to that territory.

L. E. Block, chairman of the board, Inland Steel Co., was put on the stand Friday just prior to adjournment and will resume his testimony when the hearing

is reconvened. Under direct examination he related the growth of his company. At its inception in 1893 the company had a capacity of 25,000 rail carbon steel bars per year; today its capacity is 1,000,000 tons of ingots annually. Mr. Block corroborated the testimony of Mr. Buffington as to small amount of local competition encountered by the Illinois Steel Co. until comparatively recent years.

GERMAN PRICES SKY-ROCKET

Shutting Off Shipments From Ruhr Advances Steel Prices More Than 50 Per Cent in One Week

(*By Radiogram*)

BERLIN, GERMANY, Feb. 12.—Prices of all grades of iron and steel have advanced rapidly during the past week. Foundry iron No. 1 is now quoted at 706,300 m. per metric ton ($25.11 per gross ton, at 3.5c. per 1000 m.), compared with 506,300 m. ($13.89 at 2.7 c. per 1000 m.) on Feb. 5.

Steel ingots have been advanced by the Stahlbund to 955,000 m. ($33.95), compared with 623,000 m. ($17.09) a week ago. Steel bars are now pegged at 1,331,000 m. (2.11 c. per lb.), compared with 860,000 m. (1.05 c. per lb.) and thin steel sheets at 2,104,000 m. (3.34 c. per lb.), compared with 1,341,000 m. (1.64 c. per lb.).

[Due to the rise in the exchange rate, an advance of 55 per cent in marks has been translated into 100 per cent increase, as measured in dollars.]

GERMAN READJUSTMENTS

Ore From Sweden and Coal From England and Czecho-Slovakia—Wages and Prices

BERLIN, GERMANY, Jan. 27.—German industry is making great endeavors to counterbalance the restrictions imposed by the new occupation of the Rhenish districts, and by the probable separation of these areas by a customs barrier.

The position of the different German industries must be judged according to their relation to the Ruhr district. The iron industry, of which about 80 per cent is in the occupied area, is among those mostly affected by the new French measures. The works in this area have about a normal supply of fuel and raw material. The 20 per cent in other parts of the country have also secured a supply of ore and scrap for several months, and stocks of coal have been accumulated. Only the blast furnaces experience trouble in regard to fuel. The north German works, which have been working to a great extent with British supplies, will have to do so almost exclusively in the future, and south German works will be drawing on Czeco-Slovakian resources, while the Upper Silesian works are in the favorable position of being situated right upon the coalfields. Iron foundries generally have a three months' stock of raw material.

During the last fortnight the coal supplies to other parts of the country have been well maintained, and all coal, even that intended for reparation, was diverted eastward. Large orders for fuel have also been placed abroad.

Negotiations with the Lorraine minette producers having been unsuccessful, contracts for the supply of Swedish ore have been enlarged and are running till 1932, so that a greater part of the requirements of the iron industry will come from Sweden.

Miners' wages have been increased by 77.7 per cent from Feb. 1, and amount to 8200 m. per shift. Negotiations have also been conducted with the miners' representatives to reintroduce the working of overtime at the mines outside the occupied area, and the new regulations are being voted on by the men in the different districts.

Prices Raised Every Few Days

Official iron and steel prices are being raised now every few days. The latest increase amounts to about 42 per cent. This advance seems to be dictated by the desire to attain again the world's level which had risen relatively through the catastrophic decline of the mark. Bar iron is being brought up to 576,000 m. per metric ton, which is about 6000 times the pre-war standard. The surcharge for open hearth material is raised from 35,000 to 100,000 m. per ton.

The demand is still brisk and the large works in the Rhenish Westphalian districts are well employed. On account of the occupation measures, the firms are, however, careful in booking new orders. The Society of German Iron and Steel Manufacturers has decided to boycott French, Belgian and Luxemburg material, and demands the prohibition of imports from these countries. There is less material in the market, especially in the South, and greater quantities will be imported from Austria and Czecho-Slovakia.

Scrap prices are fluctuating. They are, however, showing a stiffening tendency, and up to 400,000 m. per ton is asked. The situation in the West makes it difficult to judge the position. Up to now no large transport troubles have been experienced, but the works are holding back orders, awaiting developments. On account of the uncertainty in the development of the rate of exchange and of prices, some sellers are reluctant to part with their stock.

The terms of payment are generally cash on the fifteenth of the month following delivery, so that the risk of losses through depreciation is great, and some traders are asking cash within eight to ten days. Cast iron scrap is rising more rapidly, as it is expected that with a decrease in the pig iron production in the Ruhr districts, foundries will be more dependent on scrap.

During December metal workers' wages were raised on the average by 82 per cent for skilled workmen, and 79 per cent for laborers. Compared with July, 1914, this amounts to 425 times the rate at that time for skilled workmen, 467 times for semi-skilled, and 598 times for laborers. The pay of the skilled workmen was only 9 per cent more than that of the laborer, compared with about 54 per cent before the war. As the skilled and semi-skilled men are largely working in piece work, the difference in the pay is greater in favor of the skilled men than laid down in the wage agreements, but the process of decreasing the difference in the pay is significant of the policy of the trade unions in Germany.

Record loadings for this time of year of revenue freight continue, according to reports filed by the carriers with the car service division of the American Railway Association. The loadings of cars this year compared with those of the similar period in the two previous years are as follows:

Week ending	1923	1922	1921
Jan. 6.....	770,303	599,433	697,641
Jan. 13.....	873,251	714,191	715,855
Jan. 20.....	865,578	731,109	708,658
Jan. 27.....	871,164	740,386	701,605
Total for year to date....	3,380,296	2,785,119	2,823,759

The British Empire Steel Corporation, Bell Island, Newfoundland, iron mines, recently closed because of complications arising from the French occupation of the Ruhr district, have reopened with their full complement of 2000 men.

COKE PRODUCTION IN 1922

Increase of 44 Per Cent Over 1921—By-Product Was 78 Per Cent of Total

WASHINGTON, Feb. 10.—Production of coke in the United States last year is estimated by the Geological Survey at 36,526,000 net tons, of which 28,493,000 tons, or 78 per cent, was by-product coke and 8,033,000 tons beehive coke. These figures may be compared with 25,288,000 tons in 1921, of which 19,750,000 tons was by-product coke and 5,538,000 tons beehive coke. The gain for the year was 44 per cent.

Pennsylvania produced more than 25 per cent of the total of by-product coke in each year, having accounted for 7,181,000 tons in 1922 and 5,304,000 tons in 1921. Ohio was second in 1922 with 4,877,000 tons, but third in 1921 with 2,966,000 tons, Indiana having had 3,091,000 tons in 1921 and 3,922,000 tons in 1922. Alabama, with 3,496,000 tons in 1922 and 2,401,000 tons in 1921, was fourth in each year. No other State reached 2,000,000 tons in either year.

Estimates of the by-products recovered in 1922 placed the tar at 365,000,000 gal.; ammonia (sulphate equivalent of all forms), 946,000,000 lb.; gas, 447,000,000 M cu. ft. and crude light oil, 111,000,000 gal.

Monthly figures of production, in thousands of tons (net for coke; gross for pig iron) are given in the following table, the pig iron tonnages being quoted from THE IRON AGE:

	Beehive coke	*By-product coke*	*Total coke*	*Pig iron*
1920 average	1,708	2,569	4,277	3,077
1921 "	462	1,646	2,108	1,379
1922 "	669	2,374	3,043	2,240
" January ...	496	1,882	2,378	1,645
" February ..	549	1,796	2,345	1,630
" March	732	2,133	2,865	2,036
" April	528	2,202	2,730	2,072
" May	436	2,539	2,975	2,306
" June	460	2,589	3,049	2,361
" July	446	2,496	2,942	2,405
" August	531	1,818	2,349	1,816
" September .	608	2,241	2,852	2,034
" October	876	2,806	3,682	2,638
" November .	1,138	2,925	4,063	2,850
" December ..	1,233	3,063	4,296	3,087

Preparation of Sponge Iron

The study of the preparation of sponge iron is being continued at the northwest experiment station of the Bureau of Mines, Seattle, Wash. The object of the study is to develop a method by which sponge iron can be made by using low-grade coals and iron ore in a direct-fired, rotary kiln. The sponge iron will be prepared with a view to utilizing it in the production of foundry iron and steel, and for the precipitation of copper from solutions resulting from leaching operations. Tests will be made in a semi-commercial size furnace that will treat about a half a ton of ore per day. Attempts will be made to increase the rate of reduction of the iron oxide by adjusting the operating conditions of the furnace and the conditions of the charge. Concentration studies will be made on a product with a view to obtaining a high grade sponge iron suitable for melting in an electric furnace, or for use in precipitating copper from solution.

Internal Strains in Brass Tubes

A study of internal strains in brass tubes has been undertaken by the Pittsburgh experiment station of the Bureau of Mines in cooperation with a manufacturing company which is a user of cold-drawn brass tubing. The tubing is found to warp and move out of alinement, in the case of certain manufacturers, on maturing at the ordinary temperature. The purpose of the investigation is to carry out heat-treatment experiments for the release of the internal strains in the tubing without harming the mechanical properties. A method has been devised for determining quantitatively the amount of stress in the tube shapes; this method is called the "strip method" and entails cutting a strip in a tube sample and measuring the amount of springing out. Heat-treatment experiments have been carried out which show that cold-drawn brass tubing can be heated to moderate temperature (300 to 325 deg. C.) for moderate times without affecting the mechanical properties, but with substantial reduction in the stress. The problem is practically completed, but some few further experiments on drawing tubes are in process with brass makers. A manuscript has been prepared on this work which awaits publication.

Foreign Trade in Metals

WASHINGTON, Feb. 13.—After New York, New Orleans shows the heaviest exports and Philadelphia and Tacoma, Wash., the heaviest imports of metals in 1922, according to the annual report of Director R. T. Merrill of the Bureau of Research, United States Shipping Board. His figures on water-borne foreign commerce for the fiscal year ended June 30, 1922, show the following regarding exports and imports by ports in gross tons of ore and metals, iron and steel:

	Exports	Imports
New York		
Ores and metals.....	769,257	449,409
New Orleans		
Metals and their manufactures	149,978	.....
Baltimore		
Copper	33,566	.....
Philadelphia		
Ores and metals.....	.....	133,719
Iron and steel.....	41,513	.....
Norfolk		
Ores and metals.....	.....	15,383
Iron and steel.....	5,631	.....
Houston		
Iron and steel.....	664	1,260
Jacksonville		
Iron and steel.....	13,064	.....
Perth Amboy, N. J.		
Copper	.....	34,652
Ores and metals.....	.....	11,360
Beaumont, Texas		
Iron and steel.....	1,645	.....
Mobile		
Iron and steel	65,657	.....
Newport News		
Iron and steel.....	1,910	.....
Portland, Me.		
Metals	.....	399
San Francisco		
Minerals, metals and their manufactures	82,141	.....
Portland, Ore.		
Metals	8,567	.....
Iron and steel.....	.....	2,098
Seattle		
Metals	50,047	.....
Tacoma, Wash.		
Ores and metals	.....	126,274
Metals	46,539	.....
Los Angeles		
Iron and steel.....	.....	15,436

Of the 1,270,179 tons of exports covered in the table, 864,941 tons were shipped from Atlantic ports, 217,944 tons from Gulf ports and 187,294 tons from Pacific ports. Of the 789,990 tons of imports shown, 644,922 tons came in through Atlantic ports, 143,808 tons through Pacific ports and only 1260 tons through the Gulf.

Great Bond Issue Voted by St. Louis

ST. LOUIS, Feb. 12.—General improvement bonds of the amount of $87,372,500 were voted at the bond election in St. Louis last Friday, only one of the 21 items failing to get the necessary two-thirds majority.

The largest of the items was $12,000,000 for a new waterworks system, which will be paid for out of the revenues of the system. The expenditures under this include:

New plant on Missouri River.....	$3,777,000
Equipment for this new plant, such as generators, service pumps, etc.....	1,323,000
Supply mains, right of way, etc.....	1,977,500
One-hundred-million-gallon reservoir ...	1,150,000
Service mains	2,740,000
Contingencies, etc.	1,032,500

Other items that carried include extensive lighting, park and street improvements and the following:

Plaza in front of Union Station.....	2,600,000
For electric lighting, city-wide.....	8,000,000
For a new courthouse.....	4,000,000
For river des Peres sanitation purposes..	11,000,000
Hospitals and institutions	4,500,000
Municipal auditorium and community center	5,000,000
Memorial plaza and building.....	6,000,000
Grade crossings and viaducts.....	1,600,000
South approach to municipal bridge....	1,500,000
East side approach to municipal bridge..	1,500,000
Armory, National Guard of Missouri....	1,000,000
Public markets	1,250,000

The only item rejected was $1,000,000 for a new armory for the Missouri National Guard.

JANUARY STEEL OUTPUT

Indicated Ingot Production Rate About 45,000,000 Tons a Year—Daily Average Increase of 8½ Per Cent Over December

The largest output of steel ingots since March, 1920, was recorded in January, according to the statistics collected by the American Iron and Steel Institute, which show that 30 companies produced in January 3,251,694 gross tons. These companies made 2,779,890 tons in December and 3,299,049 tons in March, 1920. The January performance was 471,804 tons, or 17 per cent, more than that of December, but a daily difference of 8½ per cent. The January increase in pig iron production over December incidentally was not 5 per cent.

On the assumption that the 30 companies reporting made, say, 86 per cent of the total ingot steel, the output for the 27 working days of January was about 3,780,000 tons, or 140,000 tons per day, or a rate of 43,500,000 tons a year, or about 84 per cent of the country's capacity. The December production on the same basis was about 3,232,000 tons, or approximately 129,000 tons per day.

The statistics of the American Iron and Steel Institute since January, 1921, follow in gross tons:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 87.50 Per Cent of the Steel Ingot Production in 1921

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total—Whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
July	2,020,572	464,047	2,485	2,487,104
August	1,807,310	404,379	2,893	2,214,582
September	1,911,147	460,127	2,505	2,373,779
October	2,352,207	518,010	2,198	2,872,415
November	2,360,903	525,945	2,449	2,889,297
December	2,241,104	536,214	2,572	2,779,890
Total—Whole yr.	23,624,404	5,469,213	22,836	29,116,453
January, 1923	2,571,491	677,486	2,717	3,251,694

The January total for the 30 companies compares also with a record output of 3,352,196 tons in October, 1918.

Increase in Corporation's Unfilled Orders

The United States Steel Corporation on Jan. 31 had 6,910,776 tons of unfilled business on its books, or 165,073 tons more than reported for Dec. 31, and the largest amount since February, 1921, when unfilled business amounted to 6,933,867 tons. During December, unfilled business decreased 94,539 tons, and in November 62,045 tons, while in October it increased 210,680 tons, following varying increases each month beginning with March, 1922. A year ago, the corporation had 4,241,678 tons of unfilled orders, or 2,669,098 tons less than it has today. The unfilled tonnage as reported by months since January, 1920, follow:

	1923	1922	1921	1920
Jan. 31	6,910,776	4,241,678	7,573,164	9,285,441
Feb. 28		4,141,069	6,933,867	9,502,081
March 31		4,494,148	6,284,765	9,892,075
April 30		5,096,913	5,845,224	10,359,747
May 31		5,254,228	5,482,487	10,940,465
June 30		5,635,531	5,117,868	10,978,817
July 31		5,776,161	4,830,324	11,118,468
Aug. 31		5,950,105	4,531,926	10,805,038
Sept. 30		6,691,607	4,560,670	10,374,804
Oct. 31		6,902,287	4,286,829	9,836,852
Nov. 30		6,840,242	4,250,542	9,021,481
Dec. 31		6,745,703	4,268,414	8,148,122

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747.

ZINC SMELTING AND REFINING

Census Figures for 1921 Show a Heavy Decrease from 1919 Returns

WASHINGTON, Feb. 8.—Only 29 establishments are reported in 1921 as engaged in the smelting and refining of zinc, as compared with 39 such plants in 1919 and 29 in 1914. The figures for 1921 with regard to number of persons engaged in the industry, to the value of output and to the value added by manufacture were far lower than in 1919, and were lower also than in the pre-war year. Salaries and wages, however, while far below the 1919 figures, were higher than in 1914. Details are given in Table I.

Production of zinc, both primary and secondary, as reported by the United States Geological Survey for 1921 and for 1919, will be found in Table II.

Table I.—Smelting and Refining Operations in Census Years.

	1921	1919	1914
Number of establishments	29	39	29
Persons engaged	6,456	14,903	10,327
Salaried employees	678	1,107	708
Wage earners (average number)	5,778	13,796	9,617
Salaries and wages	$9,041,000	$20,245,000	$8,177,000
Salaries	1,797,000	2,462,000	1,477,000
Wages	7,244,000	17,783,000	6,700,000
Cost of materials	24,312,000	70,015,000	39,573,000
Value of products	37,483,000	104,123,000	53,538,000
Value added by manufacture (Value of products less cost of materials.)	13,171,000	34,108,000	13,965,000

Table II.—United States Zinc Production

Net Tons	1921	1919
Zinc production	240,173	511,715
Primary zinc	200,500	465,743
From domestic ore	198,232	452,272
From foreign ore	2,268	13,471
Secondary zinc	39,673	45,972
Redistilled	17,573	19,748
Remelted	16,260	20,162
Recovered in alloys, excluding old brass remelted	5,840	6,062

Silver Jubilee Convention of American Ceramic Society

PITTSBURGH, Feb. 13.—The twenty-fifth, or silver, jubilee convention of the American Ceramic Society opened yesterday morning at the William Penn Hotel. At a general session, F. H. Riddle, Detroit, president of the society, reviewed the growth of the organization and cited among the accomplishments of the last 25 years the recognition of the ceramic engineer as a technical expert upon a plane with the electrical engineer, the mechanical engineer and the architect. Mr. Riddle also paid tribute to Edward Orton, Jr., founder of the society, and reported a 25 per cent increase in the membership in the past year. A reception and acquaintanceship meeting was held at the William Penn Hotel in the afternoon and in the evening a banquet was held at which Dr. John G. Bowman, chancellor University of Pittsburgh; Karl Langenback, Washington; Dr. Samuel W. Stratton, president Massachusetts Institute of Technology, and Professor Orton were the speakers. Division sessions began this morning at the Fort Pitt Hotel and will continue tomorrow. Thursday and Friday will be given over to plant visitation.

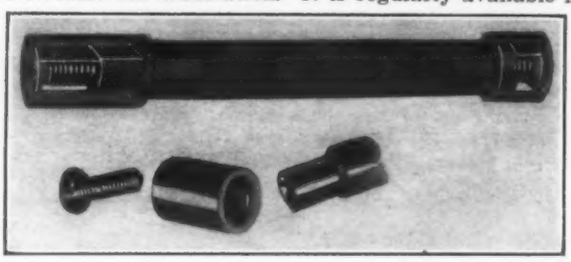
Southern Sheet Steel Co.'s Proposed Plant

Birmingham, Ala., Feb. 12.—It is announced in Chattanooga that the proposed $1,500,000 plant of the Southern Sheet Steel Co. is to be built in the near future, contracts to be let at an early date. A site of 33 acres on the river near the city has been obtained. When the river is made navigable by the building of the Woodrow Wilson dam No. 3 at Muscle Shoals in Alabama, there will be transportation the year around to Ohio and Mississippi river points. Plans include two open-hearth furnaces as the first unit, to be followed by rolling mills. W. J. Lynch, who is president and general manager, and N. C. Ralph, vice-president of the Gundling-Jones Corporation, are fiscal agents. It is announced that the larger part of the stock has been taken, partly by local and partly by Eastern people.

Reversible Plug Gages of Stellite

Reversible plug gages of Stellite, to provide maximum resistance to wear, are being marketed by the Wilton Tool Co., Detroit. As an example of durability it is claimed that in gaging pistons the instrument stood up to size for more than 8000 pieces before the gage wore undersize 0.0001 in. on the starting end. A double-end gage, it is emphasized, would have given twice the service.

The construction of the reversible gage may be noted from the illustration. It is regularly available in



Stellite Reversible Plug Gage. The ends are renewable

37 sizes from ¼ to 2½ in., and in larger sizes if required. The ends are renewable and salvage allowance is made on returned ends.

Physical Properties of Metallurgical Coke

Employing testing methods standardized during the past year, a study will be made by the Bureau of Mines of the operation of blast furnaces in the Birmingham, Ala., district in relation to the physical properties of the coke used as fuel.

Loss by "solution" of coke in the blast furnace stack gases is believed to be detrimental to economical operation. A laboratory test has been devised at the southern experiment station of the Bureau of Mines, Birmingham-Tuscaloosa, Ala., by which the relative reactivity of cokes with carbon dioxide may be quantitatively determined. Correlation of test results with those of actual furnace practice will be undertaken during the present year. The work will be conducted in connection with furnaces operating on coke from Alabama, Pennsylvania and Illinois coal.

Experiments made in the Birmingham district during the past year will be supplemented by further work at furnaces in the Pittsburgh districts and at the furnaces of the St. Louis Coke & Chemical Co., Granite City, Ill., which are operating on coke from Illinois coal. By means of analyses of gas taken from different parts of the blast furnace hearth, the rate of combustion of different kinds of coke will be determined under actual operating conditions. Results so obtained will be correlated with the physical and chemical properties of the coke as determined by laboratory tests.

In cooperation with the fuel section of the Pittsburgh station of the Bureau of Mines, the relative combustibility of cokes from Alabama, Pennsylvania and Illinois coal is being determined in the Kreisinger furnace. Rates of combustion as high as 100 lb. per sq. ft. of grate area per hour are being employed. The influence of the size of the coke pieces is being investigated. Gas analyses at different points in the fuel bed are being made. The relation between tests results and furnace practice will be determined.

In making calculations of the efficiency of operation of a blast furnace, the amount of carbon available for combustion at the tuyeres is taken as the so-called fixed carbon of the proximate analysis. The official determination of volatile matter is made at a temperature of 950 deg. C. Since coke is subjected to temperatures up to 1800 deg. C. before being burned at the blast furnace tuyeres, there is the possibility that less carbon is actually "fixed" in a condition to reach the tuyeres than is indicated by the ordinary proximate analysis. Experiments are under way by the Bureau of Mines in which the volatile matter of several varieties of metallurgical coke will be determined at temperatures up to 1700 deg. C.

There is considerable demand in the industries for a small scale apparatus which will determine the character of coke and by-products to be obtained from a given coal. The Bureau of Mines plans to construct an apparatus capable of carbonizing 100 lb. of coal and to calibrate it by testing several varieties of coal on which large scale operating data are available. The physical properties of the coke, its combustibility, and reactivity with carbon dioxide will be compared with the coke produced by large scale operation. Analysis and yields of by-products will be compared in like manner. The attempt will be made to so modify the apparatus, if necessary, that the coke and by-products produced will be identical in quality and quantity with those produced in actual practice.

There are some 30 different coal beds in Alabama, while only six to eight of these are known as good coking coals. Information is much needed as to the coking properties of other coal seams of the State. The Bureau of Mines plans to investigate the suitability for coke making of the typical coals of Alabama, first in a small scale apparatus and later to test on a larger scale such coals as show promise from small scale tests.

A study of the literature of low temperature carbonization is being made, and the suitability of Alabama coals for such treatment will be considered in connection with the work at higher temperatures.

Blast Furnace Studies

During the years 1916-1922 the Minneapolis experiment station of the Bureau of Mines collected operating data covering a total of 90 blast furnaces, including 60 iron furnaces, 11 ferromanganese, 11 spiegeleisen, 6 charcoal, and 2 high silicon iron furnaces. It has not been possible from a study of the obtained data to interpret in a logical manner all the results of commercial furnace practice due to lack of understanding concerning the fundamental reactions occurring within the blast furnace. The work will be continued as the gaps in the present information are filled by the data obtained from the operation of an experimental blast furnace designed and equipped for the purpose of making scientific observations of all the factors affecting its operation. Such a study of the blast furnace process will make it possible to bring the investigation to a logical conclusion.

Farm Implement Exports Increase

WASHINGTON, Feb. 10.—Exports of farm implements in December showed a large increase over those for November, and also over the December, 1921, total, according to the Department of Commerce. The figure for December is given as $2,936,998, compared with $1,580,351 for November and $707,349 for December, 1921. Figures for December, 1922, were the highest for any month in the year except August.

Bulletin No. 134 of the engineering experiment station of the University of Illinois, carries the title, "An Investigation of the Properties of Chilled Iron Car Wheels, Part II, Wheel Fit, Static Load and Flange Pressure Strains. Ultimate Strength of Flange." The investigation includes the determination of the strains which may occur within a car wheel, and a study of the limitations of present designs, with the object of improving the chilled iron carwheel and making it more satisfactory under present and future service requirements. The work was done under a cooperative agreement between the Association of Manufacturers of Chilled Car Wheels and the engineering experiment station of the university. Copies of the bulletin may be obtained without charge by addressing the engineering experiment station, Urbana, Ill.

President Lloyd Booth announces that in January all previous production records were broken by the Falcon Steel Co., at its Niles plant, the eight mills producing 7325 tons of sheets.

Mr. Schwab Strongly Urges Subsidy Bill

Declares That to Abandon Merchant Marine Would Be Disastrous—Great Interest Shown at Washington Meeting

WASHINGTON, Feb. 10.—Vital necessity of placing the American merchant marine on a sound and profitable basis and the injury that would result in placing American foreign commerce in the hands of foreign business rivals were emphasized in a message from Chairman Charles M. Schwab of the Bethlehem Steel Corporation at the annual convention of the National Merchant Marine Association, held in Washington last Wednesday. The association went strongly on record in favor of immediate passage of the ship subsidy bill. A committee called at the White House last Thursday and presented to the President a resolution urging action on the legislation at this session of Congress. Through a coincidence, a conference of the association was held on the day that President Harding appeared before Congress and made a vigorous appeal for a vote on the ship subsidy bill before adjournment on March 4.

The message from Mr. Schwab reads as follows:

"Unfortunately, I will be in Europe at the time of your meeting, but if you have the opportunity I wish you would convey to the members of your association my best wishes for success in their efforts to place the merchant marine of this country on a sound and profitable basis.

"I am convinced that a strong merchant marine is essential to the business prosperity of the country. This country has attained a foremost position in business and industry throughout the world, and there is no reason why we should be compelled to have our merchant ships built in foreign shipyards and our manufactured products and other goods shipped under foreign flags.

"To abandon our merchant marine at the present time would be disastrous, to say the least. It would throw out of work thousands of trained men skilled in the art of shipbuilding, who would have to commence anew to learn other trades.

"Hundreds of shipyards built up at a cost of millions of dollars would have to be scrapped. But by far the greatest injury would come to our country in placing our foreign commerce in the hands of our foreign business rivals. For this is certain to happen if this country is compelled to ship its goods under foreign flags.

"Nor is there any doubt in my mind that the same American enterprise and aggressiveness which have made this country the workshop of the world will soon place our shipping and shipbuilding on a profitable basis and a basis which will mean increased prosperity to the country, if our shipping interests receive the same cooperation from our Government that the merchant marines of other countries receive from their Governments."

Great Interest Shown

Agricultural interests as well as manufacturing industries throughout the country were represented at the meeting of the National Merchant Marine Association. It was particularly noticeable that the signing of a memorial for Congress in behalf of the ship subsidy bill carried names representing practically all of the great industries of the United States and that more business men were present from the interior than shipping men from the coast. This was taken to indicate that the interior has become as greatly interested in the necessity of establishing a merchant marine as have the shipping people themselves.

Congressman Edmunds of Pennsylvania described some of the fallacious arguments that were used against the shipping bill and said that the public needed more and more information before it could be expected to become ship-minded. He dwelt especially on the present legislative situation of the bill and roused much enthusiasm by his optimism in regard to it.

During the day's proceedings more than 20 speeches were made, in all of which the need of an American merchant marine was emphasized. One of the unusual speeches of the day came from S. G. McLendon, Secretary of State of Georgia, who came as representative of that State. Addressing the convention from his wheelchair, he said:

"Every one in America should get back of President Harding in his efforts to get an adequate American merchant marine. It is the only way to assure our future prosperity and the nation's safety."

Senator Ransdell of Louisiana outlined the work the association had been doing in the last year and said that if the shipping bill passed its work had only begun, as the American people needed much information to become really ship-minded and make the American merchant marine the success it deserved to be.

"If the shipping bill does not pass," Senator Ransdell added, "it will become even more imperative for us to continue our work and to extend it widely. I am proud to say that the work this association has done already is having its effect. There is no limit to what may be done and we shall do it."

The necessity of a merchant marine as a matter of national defense was emphasized by Assistant Secretary of the Navy Roosevelt.

Foreign Trade

"The necessity of a merchant marine for foreign trade has been acknowledged," said Col. Myron W. Robinson, president of the American Manufacturers Export Association. "But I would like to go further in this, not in theory, but in plain facts, in a business-like way. I believe the shipping bill is thoroughly misunderstood. Those who are supposed to oppose it the strongest, the farmers, are the ones that it would favor the most. Our foodstuffs have been our biggest export.

"The farmer needs to have the merchant marine under the American flag maintained in order to be assured of a reasonable transportation rate. The only way he can assure himself of this American merchant marine is by supporting the present shipping bill."

"It is not tolerable that we should, either in peace or war, be dependent on any other nation for our international trade conditions," said Robert Haig, vice-president of the Sun Shipbuilding Co., "and to us, now that naval disarmament is likely to reduce our warships almost to the vanishing point, the necessity of a real mercantile marine is vitally important."

Reasons for Urging Bill

Summing up his reasons for urging the shipping bill, Mr. Haig made these chief points:

1—Employment of tonnage now idle; employment of American capital and American labor in building more ships; keeping at home money earning by foreign capital and foreign labor by ships carrying our goods.

2—From a military viewpoint because army and navy cannot operate without a strong fleet of merchant ships as auxiliaries.

3—Encouragement in buying the Government fleet and reduction thereby of the losses due to Government operation.

4—Building by Americans of special types of vessels to open up new trade routes, with resultant new export business.

5—Will encourage shipyards to keep up-to-date and develop more economical forms of power and construction.

6—As an adjustment of national conditions and putting shipping on a par with other American industries.

President John E. Edgerton of the National Association of Manufacturers, in a strong address, declared that it is necessary for the United States to have an adequate merchant marine, sufficient to meet the present needs and gradually expanding, commensurate with the overseas trade. He declared it was necessary that the Government give real aid to American shipping and that manufacturers believe that in the present emergency of a deteriorated merchant marine the Government should grant a subsidy which should definitely provide for a proper return to the Government after a reasonable profit has been made by the shipping companies in the operation of their fleets of cargo carriers.

LABOR'S SAVINGS

Unions Going Into Banking—Plans Adopted by Manufacturers

Reports secured by the National Industrial Conference Board from 80 business concerns which conduct savings organizations furnish examples of the success attending financial relations between employees and employers. Men and women who had never taken the trouble to open a bank account found it convenient to start a savings account in their place of employment. This introduction to banking methods pleased wage earners. They were quick to recognize the advantages of thrift.

In many plants which have reported to the National Industrial Conference Board, the company acts as banker for the employees, in which case the rate of interest paid on employees' deposits is usually higher than that obtainable in savings banks. In other plants, the company deposits the employees' savings in a local savings bank, thereby saving the worker the time and trouble of going to the bank himself. A plan of this type has been in operation in the Crompton-Knowles Loom Works, Worcester, Mass., since December, 1919. This company reports that since that date approximately $215,000 has been deposited by its employees in the five savings banks of the city.

One of the most interesting industrial savings plans is that of the Westinghouse Electric & Mfg. Co., Pittsburgh. Under this plan, if an employee becomes a depositor in the savings fund to the extent of 2 per cent of his earnings, he is insured by the company for $500. This insurance is increased $100 each year after the sixth year of service up to $2,000 for employees of 15 years' service. Interest is paid on the employees' savings at the rate of 4½ per cent. The plan also includes a loan feature, whereby the depositor may borrow up to 90 per cent of his savings at 6 per cent, but without sacrificing the 4½ per cent interest to which his deposits are entitled, or his insurance.

The United States Steel Corporation is among the pioneers who encouraged financial cooperation with wage earners. In 1903, the corporation first offered to its employees an opportunity to subscribe for shares of its common stock. Employees today own stock of a par value of approximately $18,000,000.

The savings and loan association of the New York Edison Co. has paid out in dividends more than $150,000 and has received more than $1,000,000. At the time of submitting a report, 707 of the 750 persons employed by Winship, Boytt & Co., Wakefield, Mass., had received in cash and certificates $174,000 from the company's profit-sharing plan. When stock subscribed by 30,000 employees of the General Electric Co. is fully paid this year, there will be nearly 52,000 stockholders in the company.

The Baker Mfg. Co., Evansville, Wis., has distributed about $914,000 in stock and $125,000 in cash among employees. Employees of the Celluloid Co., Newark, have invested nearly $400,000 in their savings and loan department. The employees' saving fund of the Pennsylvania Railroad has nearly $9,000,000 to its credit. Since the establishment of the fund, about $6,000,000 has been paid to depositors as interest.

The report of the Conference Board says in part:

"The above are a few of the business concerns who have provided banking activities in which wage earners participate. Whatever the form taken by these activities—whether as savings accounts or payments for stock—the wage earner has learned that he can make wage-money work for him and when it is thus employed, it is neither tainted nor is the man who handles it subject to incrimination.

A late development in labor-banking circles has to do with the purchase by the Brotherhood of Locomotive Engineers of a substantial interest in the Empire Trust Co. This transaction offers further proof that old barriers of antagonism and suspicion are disappearing. Instead of the representatives of labor being arrayed against the representatives of capital, they will assemble harmoniously around the directors' table.

"The theory that banking is a powerful factor in the field of economics has alway been emphasized by leaders of capital. So, it would seem, labor and capital have come to a complete mutual understanding on the subject of banking.

"Trade union banks also have found the business of banking profitable. Of the ten established in this country in the past three years, the Brotherhood of Locomotive Engineers' Cooperative National of Cleveland is the acknowledged leader. At its opening in November, 1920, $651,000 of its subscribed capital stock of $1,000,000 was paid in. For a time, the bank grew at the rate of $1,000,000 a month. In a recent report, assets of $15,547,000 are recorded. Depositors share in the profits as well as draw regular interest rates.

"Another staunch institution is the Mount Vernon Savings Bank of Washington, organized by the International Association of Machinists. Beginning in May, 1920, with a paid in capital of $200,000, its present resources are reported as $2,700,000. Its board of 21 directors has only ten members who are in any way connected with organized labor interests. The eleven outside business men on the directorate work in hearty accord with their union labor colleagues. Labor groups have authorized the chartering of eleven new banks in nine cities in the coming year. Trade union banks are already operating in New York, Cleveland, Washington, Chicago, Birmingham, Ala., San Bernardino, Calif., Tucson, Ariz., and Three Forks, Mont.

"Economists pointing to the fact that labor and capital are working in newly-established harmony, in the fields of finance, say that the missionary service accomplished by banking will result in a better understanding in all fields of industry."

Work of National Screw Thread Commission

The National Screw Thread Commission, of which the director of the Bureau of Standards has been chairman, is making good progress in the standardization of screw threads. In addition to the progress report covering regular bolts and nuts, several reports have been prepared covering special threads, such as fire hose threads, small hose threads, and special threads for electrical fixtures and fittings. The standardization of threads for oil well casing is now under consideration in cooperation with the standardization committee of the American Petroleum Institute, the Mid-Continental Oil and Gas Association, as well as makers and users of oil casing.

At a meeting of the commission held in New York on Jan. 17, action was taken which will tend to further simplify and unify screw thread practice. It was voted to allow the same tolerances on major and minor diameters for all classes of fit and to recommend certain combinations of tapped holes of one class with screws of another class. This action will reduce the number of grades of fixed tools which must be carried in stock by a manufacturer in order to produce screw thread fits of all classes.

HIGH PRICES CURTAIL EXPORTS

Japanese Merchants Less Active—Rail and Tin Plate Inquiries—More German Iron Received

NEW YORK, Feb. 13.—Merchant buying from both Japan and China, which was stimulated largely by the French entrance into the Ruhr, is less active than a few weeks ago. The speculative buying, which it was feared might develop in Japan into a serious situation, has evidently been considerably curtailed by the rising American market and most of the present purchasing by Japanese merchants is believed to be of a legitimate nature. While there has been some purchasing of black sheets, by far the greater part of merchant requirements is believed still to be going to British mills, as the price quoted by American sellers is now put at about $106 per ton, c.i.f. Japanese port.

The Chinese markets are quiet, as was expected at this time, and new business of any size is not looked for until after the Chinese new year. The political situation in China also is probably somewhat of a deterrent to large buying. Exporters dealing with other than Far Eastern markets report fair activity from Australia and good business from New Zealand, where merchants are in a prosperous financial condition. South Africa, however, is still quiet and evidently has not yet recovered from depressed business conditions.

Among the current inquiries of size from Japan is a tender from the Imperial Government Railways for 7100 tons of 75-lb. rails and there is an inquiry from a private railroad source for about 10 miles of 60 and 75-lb. rails. In addition to the tin plate inquiry for 13,500 boxes, recently reported, there is a tender in the market for 16,500 boxes of oil can sizes from the Nippon Oil Co. The development and extension plans of the South Manchuria Railway Co., for its fiscal year beginning April 1, include the purchase of electric equipment and construction on gas plants, harbors and mines, in addition to its usual railroad construction activities.

The National Petroleum Division of the Argentine Republic, Buenos Aires, is receiving bids until March 7, on 134,000 meters of seamless steel or lap-welded oil casing, 4 to 16 in., 256 steel shoes and 186 spare couplings, according to the Bureau of Foreign and Domestic Commerce, which has available the specifications covering these requirements.

Cross Currents in Pig Iron

No further shipments of French pig iron are being made, says a large importer of Continental iron. Furnaces with export contracts refused to continue shipping pig iron to foreign purchasers after Feb. 8, when the Government ruling stopping payment of bonuses to furnaces went into effect. The French pig iron producers point out that if sellers wish to sue them for non-fulfillment of contract and win the suit in French courts, they will then have grounds to sue the Government for non-payment of the bonus, which would have enabled them to produce and ship the pig iron under contract.

An importer of foreign iron who, during the coal strike, brought in some tonnages of British coke, reports that he has received several inquiries from French furnaces as to the price of American coke, but states that at present the market is too high to permit of exports. He reiterates his belief that the time is not far distant when American pig iron may be exported. He points to a rising market in Britain and looks for the first foreign demand to appear from Holland. At present the American product is too high to compete with European and British iron, but with the scarcity developing on the Continent and British iron higher, the American price, which at present would be from $31 to $32 per ton, c.i.f. Holland, might prove satisfactory for business.

In the meantime, German shipments of pig iron from Hamburg continue, and an importer having a contract with a Hamburg furnace states that the German seller has promised delivery of 10,000 tons in February.

German industry is evidently keeping pace with the industry of other countries in hydro-electric development. The representative in the United States of a German interest points out that the Lautawerke at Brandenburg, one of the largest aluminum works in Germany, the other large plant being at Cologne, at present occupied by France, is working on a hydro-electric power project which, when completed and in operation by the end of 1923, is expected to increase the production of the plant from about 16,000 tons per year to 25,000 tons.

Manganese Ore

While the demand in the United States for Caucasian manganese ore is no greater than usual, prices are reported strong at 32c. per unit for ordinary and 35c. for washed ore. This upward tendency of prices is attributed to the storms in the Caucasus which have resulted in flooded mines, causing a shortage of washed ore and to the fact that present demand from European consumers is such as to bring prices equivalent to 40c. per unit in the United States.

The Den Norsk Valsevaerk (Norwegian tin plate mills) at Bergen with a plant at Simonsvik, which was organized in 1916 to furnish tin plate to the Norwegian fisheries, has gone into liquidation, says a report to the Bureau of Foreign and Domestic Commerce. The plant, in which the Norwegian Government was largely interested, had a capacity of about 200,000 boxes of tin plate per year, about 40 per cent of the Norwegian consumption. It is equipped with modern machinery purchased in Germany during the war and was largely operated by German technical experts and foremen. The plant has never been able to compete with foreign tin plate.

Our World Trade for Nine Months of 1922

In a 24-page pamphlet, 6 x 9 in., the Foreign Commerce Department of the Chamber of Commerce of the United States, Washington, makes an analysis of the value and volume of principal exports and imports between the United States and the chief foreign markets. Comparisons with the corresponding nine months of the previous year are made on a number of separate bases, the first one being a grouping according to the use or degree of manufacture. A list is given of the 50 chief exports, ranked according to value; the 75 chief exports according to quantity as measured in pounds; a comparison of exports by grand divisions; the 70 best customers in order of importance; the 50 chief imports in value and the 91 chief imports in quantity.

The first iron and steel item consists of sheets, plates, skelp and strips, the amount for nine months of 1922 being 592,000 net tons. This item stands fourteenth in the list, while iron ore, fifteenth in order, shows 561,000 tons. It should here be noted that the "order" depends in large degree upon the amount of sub-division of a major commodity.

Among imports, coal and coke (3,091,000 tons) are third, iron ore (742,000 tons) sixth, manganese ore and oxide (367,000 tons) twelfth and pig iron nineteenth.

Will Build Second Stack

The St. Louis Coke & Chemical Co., Granite City, Ill., will construct a second blast furnace, with a capacity of 500 tons of pig iron per day, according to an announcement made by C. R. Holzworth, general superintendent of the plant. The new furnace will cost approximately $1,500,000. A large portion of the ore used by the company comes from Missouri mines, and the remainder from the Lake Superior district.

Prof. C. C. Leeds, head of he department of machinery production, college of industries, Carnegie Institute of Technology, Pittsburgh, will be the speaker at the monthly meeting of the Pittsburgh Foundrymen's Association, at the General Forbes Hotel, Pittsburgh, Monday evening, Feb. 19. His subject will be, "Training for Foundry Executives."

TIN PLATE DOUBLING MACHINE

Labor Saving Device for Bending Sheets Introduced Into South Wales Plant

It has been freely asserted in the South Wales tin plate trade that doubling is an operation which must always be performed manually. This involves laborious work, and naturally the workers demand that the sheets shall be passed to them at the best temperature for such an operation; to insure this, the sheets themselves are too often heated beyond their critical point, and this evil is generally recognized, but is passed by as unavoidable.

To avoid this trouble, a machine described by *Iron and Coal Trades Review* has been developed at the Mellingriffith Works, Whitchurch, Cardiff, Wales, from designs of H. S. Thomas, managing director, and W. R. Davies, works director. The construction is robust and embodies a minimum of parts, none of which are delicate. The standards are connected at their upper and lower ends by tie-bars, and to the upper end is also secured a roller track. Mounted between the standards is the moving column, the correct position and smooth working of which is secured by the arms, the ends of which terminate in rollers which travel the track. Laterally projecting arms of the column are provided with rollers mounted on vertical spindles, which take a bearing against the locking rods. The column is driven by a pair of endless chains operated by sprocket wheels; upon the sprocket spindles are also mounted spur wheels which mesh with spur wheels on the cross-shaft.

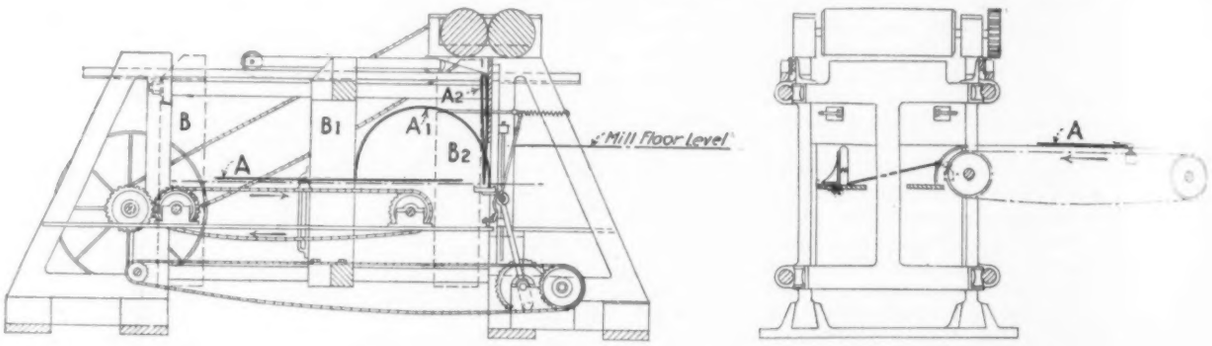
The feeding platform is built up of strips spaced to allow the operation through the spaces of a turnover gear, as also positioning fingers which adjust and feed the sheet into the machine. This table is arranged to be installed at mill-floor level, and the construction is such that it might form a continuation of a conveyor system feeding direct from the mills, the operating fingers forming the upper members of an endless chain. The turnover gear is provided because, as the curve of the sheets on leaving the mill would naturally be upward, by the reversal of this curve the functions of the machine are materially assisted.

The platform is provided with a positioning stop capable of adjustment for the longitudinal edge of the sheet, and the bar carries a curved guide plate over which the opposite edge of the sheet travels down onto the platform. The distance between the positioning members, being approximately the width of the sheet, controls the lateral movement. This side-pressure guide is hinged at its upper end to the web and arranged to be capable of adjustment on the platform to meet varying widths of sheet, minute variations being provided for by springs interposed between the web and the inner face of the sheet; the springs also serve to maintain the sheet firmly in position during the doubling operation.

When the sheet is fed into the machine, the traveling column is in the position shown by the dotted lines (see *B*, Fig. 1). When the column reaches the mid-position, *B*1, the sheet *A* is in the form of an arch, due to the pressure between the column and the fixed rear standard. When the column has completed its forward stroke to *B*2, the sheet will have assumed the form shown by the black lines.

As soon as the column commences the rearward stroke, gripping arms hold the sheet in engagement with the rear standard. The cranked ends of these arms are connected to rods, the turning of the arms into the gripping position being effected by the crank-operated rod pressing against the dependingly inclined rods when it is lifted by the main crank rod. When the pressure on the inclined rods is removed by the return of the rod to its neutral position, the gripping arms are released by the action of the coil springs. The method of driving the crank is clearly shown, the driving sprocket free-wheeling on the forward and becoming operative only on the return stroke of the traveling column.

Arms are provided on the rod which, in the neutral position, lie below the sheet, but which, when operated by the connecting rod, serve to lift the sheet and feed it into the pair of transverse rolls above the rear standard. The rolls, which are chain-driven, not only complete the doubling operation very effectively, but also serve to deliver the sheet to a convenient point for handling by hand or conveyor, as the case may be.

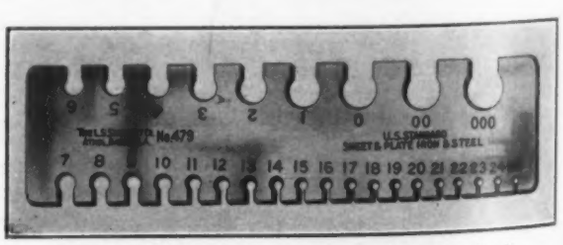


In Starting the Operation, the Sheet Is Delivered from *A* (Right Hand View) to *A* (Left Hand View), Falling into Position as Shown at Right. At this time the traveling column is at *B*. Advancing toward the right, the column, when it has reached *B*1, has caused the sheet to assume the form of *A*1. At the end of the stroke, with the column at *B*2, the sheet has been doubled up as at *A*2, and is ready to be drawn up through the pinch rolls at top

It will of course be understood that the amount of lap is adjustable, so that shearing wastage is reduced to a minimum. For the purpose of testing the capabilities of the machine the sheets were bent cold, a pretty severe test which clearly demonstrated that the machine was equal to deal with outputs far above that of any single mill; indeed, it is probable that one machine would serve a pair of mills.

Gage for Sheets and Plates

Three new rolling mill gages for use on sheet and plate iron and steel have been added to the line of the L. S. Starrett Co., Athol, Mass. They are for English or Birmingham standard, numbers 000 to 25 and 1 to 32, and U. S. standard, numbers 000 to 25. The decimal equivalents of the numbers are stamped on the back. The gages are hardened and tempered and each gage is tested. They are approximately $\frac{1}{8}$ in. thick, $1\frac{7}{16}$ in. wide and $5\frac{7}{8}$ in. long.



Decimal Equivalents Are Stamped On the Back

REPUBLIC EARNINGS

Much Better Showing Made Last Year Than in 1921—Mr. Topping's Comments

The Republic Iron & Steel Co. in its report for the year ended Dec. 31, 1922, shows a marked improvement in the financial condition as compared with the preceding year, as the net profits for the last year were $418,311.85, compared with a deficit of $5,665,242.14 in 1921. In 1920 the net profits amounted to $7,616,522.45. Production of the various products for the three years was as follows:

	1922	1921	1920
Iron ore	969,669	299,319	1,677,699
Coke	606,191	337,671	980,484
Limestone	10,832	.....	58,462
Pig iron	632,498	301,080	972,188
Bessemer steel ingots	122,013	122,068	502,177
Open hearth steel ingots	609,535	207,710	482,776
Total steel ingots	731,548	329,778	984,953
Finished and semi-finished products	733,496	336,746	1,004,189

Coke and finished and semi-finished products in net tons, all others gross tons.

The production at the Bessemer plant in 1922 was slightly below that of the preceding year and was the smallest in the history of the plant, the production for the three years being as follows: 1920, 502,177; 1921, 122,068; 1922, 122,013. The number of men employed in 1922 was 8826, compared with 5623 in 1921 and 13,230 in 1920. The wages earned per man in 1916 were $979, in 1920, $2,190 and in 1922 $1,485.

In commenting on the report, Chairman John A. Topping said:

The Year Reviewed

"The year 1922 opened with demand for iron and steel at low ebb, with operations at about 30 per cent of capacity. During the first quarter of the year, with demand subnormal, prices remained abnormally low. Recovery, however, set in during the second quarter, and production gradually increased during this period, with operations close to 70 per cent of capacity. After July 1, 1922, due to the effect of insufficient coal and lack of transportation, caused by the coal and railroad strikes, production was again reduced to 50 per cent or less and so continued during the third quarter. Costs also, during this period, were adversely affected by coal purchases at high prices. As a result of these adverse influences, operating losses occurred as heretofore reported in our quarterly reports for the period from Jan. 1 to Sept. 30, 1922, which aggregated $764,376.64. During the last quarter of the year, after the settlement of the coal and railroad strikes, and with the resumption of coal shipments from our own mines, costs were reduced, transportation service improved, followed by increased output and better prices for iron and steel, with plants working at 80 per cent of capacity. In consequence of these changes, the net profits for the fourth quarter of the year were sufficient to offset all previous losses, and leave a net balance of profit and loss, for the year ending Dec. 31 (after the inclusion of dividends on sundry stocks) of $418,311.85, and after making all deductions for interest on bonds, depreciation, extinguishment and all other proper charges.

"Owing to the business conditions ruling in the early part of the year, and to losses previously incurred, the board of directors, under date of Feb. 23, ordered a suspension of the preferred dividends, and in consequence dividends in arrears now amount to 7 per cent. Resumption of dividend payments will be authorized whenever the board of directors are reasonably satisfied of the continuance of present earnings.

Construction Program

"During the year ample expenditures were made for upkeep of plants and property, with full allowance for all provisional funds, and the board of directors decided upon a construction program which it is estimated will be completed on Jan. 1, 1924, and which will not only increase production, but it is expected to bring about large economies in operation. It is estimated that this program will increase earnings by at least $1,500,000 per annum, measured by present costs and profits. Since 1914 the company has expended approximately $30,000,000 for improvements and property additions and reduced its funded debt to the extent of approximately $4,400,000. In order to reimburse the company in part for these capital expenditures and to place it in a position to undertake the new construction program, the board of directors, acting under the powers conferred by the charter of the company, decided to authorize a new mortgage upon the plants and property of the company and to sell $10,000,000 in principal amount of new 30-year 5½% gold bonds. The mortgage is to contain provisions for the issue of additional bonds for refunding and for capital expenditures, subject to restrictions approved by the board.

"During the year, the surplus fund was increased by the amount of net profits realized, making the net balance of the surplus fund as of Dec. 31, 1922, $29,994,641.20, while the balance of net quick assets has been increased to the amount of $16,156,770.92.

Unfilled Orders and Business Outlook

"As your company is a stockholder in the Consolidated Steel Corporation (a company organized under the Webb act for the promotion of foreign trade), and as that company has determined by appropriate action of its board of directors to go into liquidation, your company has taken steps to reorganize its selling department, and will hereafter conduct its export business on a direct basis.

"On the whole, the general outlook for the year 1923 is decidedly more encouraging, as both demand and prices are tending upward, and under these conditions further improvement in profits is promised."

Inventories

Classification	As at Dec. 31, 1922	As at Dec. 31, 1921	As at Dec. 31, 1920
Finished product	$3,549,784.96	$3,924,156.86	$3,851,718.57
Pig iron	397,162.68	1,373,565.62	2,302,051.67
Puddle mill products	27,706.64	25,692.65	14,494.03
Billets, blooms, slabs, etc.	601,641.19	528,601.20	680,668.26
Ores	5,526,127.40	6,437,291.31	7,285,065.29
Scrap	476,989.48	278,767.62	740,297.67
Ferromanganese	164,510.81	73,771.29	264,565.40
Fuel	630,809.52	457,318.46	690,690.68
Rolls, molds and stools	172,777.51	127,218.04	415,785.68
Stores	1,955,896.93	1,646,731.76	2,043,256.47
Commissary supplies	81,097.37	74,033.59	116,188.84
Miscellaneous	246,680.86	184,655.69	346,495.87
Total	$13,831,185.35	$15,231,804.09	$18,751,278.43

Earnings and Disposition of Income

	Year Ending Dec. 31, 1922	Year Ending Dec. 31, 1921	Year Ending Dec. 31, 1920
Gross profits	$2,520,861.94	$809,120.19	$14,174,163.58
Depreciation and charges	2,102,550.09	4,856,121.95	6,557,641.13
Net profits	418,311.85	5,665,242.14	7,616,522.45
Dividends	.....	2,200,000.00	3,550,000.00
Amount carried to surplus	418,311.85	7,865,242.14	4,066,522.45
Balance surplus account	29,994,641.20	29,576,329.35	37,441,571.49

Powdered Coal in Large Boilers

Tests carried out by the United States Bureau of Mines in cooperation with the Combustion Engineering Corporation, New York, in a boiler of the Milwaukee Electric Railway & Light Co., were intended to determine the thermal efficiency, ease of operation and other particulars of a boiler equipped especially to burn powdered coal. The boiler tested has 13,380 sq. ft. of heating surface and was run at rates varying from 4000 to 8000 B.t.u. per sq. ft. of surface. The average thermal efficiency attained was about 84 per cent, with slight variations with varying rate of steaming. The high figure given is attributed to the small loss from incomplete combustion and the small amount of excess air, which varied from 5 to 36 per cent.

There were 26 tests, varying in length from 17½ to 42⅓ hr., while the boiler rating in the different tests varied from 130 to 257 per cent. In only two tests did the efficiency fall below 80 per cent, the lowest being 79.5 and the highest 86.9 per cent. Including the economizer, the total efficiency was in all tests above 84 per cent and in two cases exceeded 90 per cent. The coal was so ground that from 89 to 95 per cent would pass through a 100-mesh sieve.

HARDNESS OF SMALL PIECES*

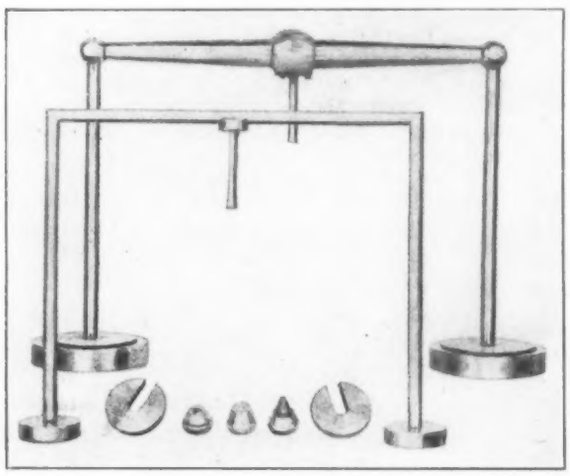
Determined by Special Attachment for Brinell Machine

BY E. D. CAMPBELL

THE object of the present paper is to describe an attachment for the standard Alpha Brinell machine, which attachment has been in use in this laboratory for the past two or three years and enables hardness measurements to be made on small bars with almost as much ease and accuracy as can be done on larger specimens, working under standard conditions.

In the illustration are shown, in addition to the large regular balance, corresponding to a pressure of 500 kg. on the ball, the light balance giving 95 kg. pressure; two weights giving an additional 21 kg., and three holders for balls of 10, 5, and 2 mm. in diameter.

The principle involved in working out the light balance was that if a small ball—2 mm. being adopted—



Brinell Machine Attachment For Use With Small Specimens

were pressed into a smooth surface of given hardness and the image of the impression observed when a 16 mm. objective is substituted for the 48-mm. supplied with a Brinell microscope, there must be some pressure which applied to the 2-mm. ball would give an impression which viewed through the 16-mm. objective would appear the same size as an impression made with a 10-mm. ball under 3000 kg. load on the same surface, but observed through the 48-mm. objective.

An approximate calculation of the weight necessary for a light balance was computed from the following data:

The large balance, equivalent to 500 kg., weighed 3944 g., or a little less than 7.9 g. for each kg. pressure. When the 16-mm. objective was substituted for the 48-mm., the magnification was increased 5.75 times. The pressure, therefore, which it would be necessary to apply to a 2-mm. ball would be approximately $\frac{3000}{(5.75)^2}$, or very nearly 91 kg.

In order to allow for possible friction of the piston, etc., a balance was constructed out of light brass tubing, the whole weighing a little over 800 g., or equivalent to something over 100 kg. A piece of steel of uniform hardness and plenty large enough to use under standard conditions, was then carefully polished and duplicate impressions made with a 10-mm. ball under 3000 kg. pressure. The light balance was then substituted for the regular one and the 2-mm. ball substituted for the 10-mm. An impression made with the 2-mm. ball with the light balance was then observed through the 16-mm. objective. The impression appeared, as was expected, a little larger than the standard observed through the 48-mm. objective. The light balance was then removed, the weight dressed down a little, and the balance again tested as before. The light balance was thus experimentally calibrated until finally, when the weight had been reduced to an equivalent of 95 kg., the image obtained with the 2-mm. ball under 95 kg. observed through 16-mm. objective, exactly coincided with that obtained with the 10-mm. ball under standard conditions.

Comparisons were then made through a wide range of hardness, from that of ingot iron to freshly hardened hyper-eutectoid steels, the results obtained agreeing equally well throughout the whole range. In order to obtain close agreement, it would of course be necessary that each instrument be calibrated individually in accordance with the relative magnifying power of the objectives used. If the instrument is thus calibrated, the tables of hardness numbers computed for the 10-mm. ball under 3000 kg. may be used equally well when the hardness is measured with a 2-mm. ball under 95 kg., but the image observed with the 16-mm. objective.

In order to adapt the instrument to the measurement of soft metals such as are ordinarily measured with the 10-mm. ball and 500-kg. pressure, the following changes were made: A carefully polished surface of pure annealed copper was used in calibrating. Duplicate impressions were made on this with a 10-mm. ball and 500 kg. and observed in the usual manner. A 5-mm. ball was then substituted for the 10-mm. and an impression made with the 95-kg. balance. When this latter impression was observed through a 32-mm. objective, which would increase the magnification 2.20 times as compared with a 48, it appeared somewhat too small. Ordinary weights were then added to the balance, new impressions made and observed through the 32-mm. objective until it was found that the addition of weights equivalent to 21 kg. would give an impression which, when observed through a 32-mm. objective, exactly coincided with that from a 10-mm. ball under 500 kg. and measured in the usual way. By using a 5-mm. ball under 116-kg. pressure and observing through a 32-mm. objective, the same hardness tables give values for a 10-mm. ball under 500 kg.

In order to obtain the most satisfactory results when using a 2-mm. ball with the light balance, a number of conditions should be observed. By rubbing a little heavy grease in the hemispherical depression of the holder and then pressing the ball in, the latter will have no tendency to fall out when in use. Magnetizing the holder causes the ball to leave the depression and seek the edge of the holder. The surface to be tested must be polished almost the same as for metallographic work, although some very fine scratches are often useful in detecting the outline of the depression, since the pressure of the ball produces a perfect polish in the depression itself. When the surface to be tested has been polished, it should be rubbed over with a slightly oily cloth, in order to lessen the friction between the ball and the surface of the metal being tested. When making an impression the pumping up to the point where the balance rises should be done slowly and very carefully to avoid any temporary excess of pressure, and when the pressure is up to that indicated by the balance, it should be held at this point at least one and a half minutes to ensure equilibrium.

On account of the small size of the impressions and the use of a 16-mm. objective, it is necessary to use a fine adjustment in order to focus. For this purpose the tube of the Brinell microscope may be placed in an ordinary microscope stand and a mechanical stage may be used for moving the specimen until the impression is in position for focusing and reading the diameter. Strong daylight gives decidedly the most satisfactory illumination, but when this is not practicable, oblique illumination from two lamps, one on each side of the specimen, may be used.

*From a paper delivered before the Iron and Steel Institute, London, England, September, 1922. The author is professor of chemistry, University of Michigan.

Herbert DuPuy, former chairman, Crucible Steel Co. of America, who sued the company for $117,000 which he claimed was due him under the deferred compensation system of the company, lost his suit when Judge Swearingen, in the Common Pleas Court in Pittsburgh, granted a motion of the defendant asking binding instructions to the jury in favor of the company, on the grounds that Mr. DuPuy has not made out a case. The case will be appealed.

CALLS FOREIGN TRADERS

President Farrell Announces Tenth National Foreign Trade Convention to Be Held in New Orleans

James A. Farrell, chairman National Foreign Trade Council and president United States Steel Corporation, has called the foreign traders of the United States to meet at the Tenth National Foreign Trade Convention in New Orleans, May 2, 3, 4, next, and announced that the central theme of the convention will be "European Conditions as Relating to World Trade."

This convention is the outstanding foreign trade gathering of the year and is attended by manufacturers, merchants, bankers, transportation officials and producers representing every line of industry entering into foreign trade.

"The foreign trade of the United States," says Mr. Farrell in his call, "renders a service that is of benefit to the nation and the individual. It assists in supplying material for our industry and furnishes an outlet for our products. It is an agency of prosperity that is entitled to our thoughtful study.

"The changing conditions of production and consumption that necessarily accompany normal growth naturally affect our foreign trade, constantly presenting new opportunities and raising new questions for consideration, quite apart from the problems attendant upon the period of recovery from the disturbance of economic relationships through which we are now passing.

"Cooperative examination of such problems is a proved factor of helpfulness. To provide a national opportunity for such consideration of the questions confronting American foreign trade; to examine its present condition and its need for the future; to study means of assisting to restore production and consumption abroad as well as at home; to improve transportation, on land and sea; and to secure the thoughtful judgment of experienced business men on these and other matters of vital concern to all the American people, the National Foreign Trade Council will hold the tenth national foreign trade convention in New Orleans, on May 2, 3, 4, 1923.

FRENCH MARKET ADVANCES

Coke Shortage Causes Upward Movement—Marked Decline in Ruhr Receipts—Efforts to Revive Comptoirs

PARIS, FRANCE, Jan. 25.—Before the present occupation of the Ruhr district began it was foreseen that it would bring about, in its inceptive stage, a certain disorganization in the fuel shipments. The following figures indicate the tonnage of Ruhr coke received this month by French blast furnaces through the Société des Cokes de Hauts-Fourneaux:

	Metric tons
Jan. 1 to 12	151,500
Jan. 13 to 15	18,200
Jan. 16	4,600
Jan. 17	1,394
Jan. 18	603
Jan. 19	0
Jan. 20	0

Stocks of coke at French furnaces are restricted—about eight days' supply—and as a consequence purchases of British coke not helping the situation much, the blowing out of blast furnaces is now proceeding in the East and in Lorraine.

This created a stir in the French iron and steel market, which was even then a rising one. Prices at the beginning of this week are now no longer quoted and today there are practically no quotable prices.

Coke.—The Société des Cokes de Hauts Fourneaux has purchased from collieries of the Nord and Pas-de-Calais 30,000 tons of coke per month at 107 fr. per ton at ovens, and from collieries of the center of France 8000 tons of coke per month at 112 fr., at ovens. These prices are valid for three months. Prices of coking slacks are 72 fr. in the Nord and Pas-de-Calais and 82 fr. in the Central coalfields.

Pig Iron.—Available supplies of foundry iron for delivery in February are scarce at 275 to 290 fr. for chill-cast foundry pig iron No. 3 P. L. Prices of hematite iron at furnaces range from 320 to 360 fr. A concern in the North of France has made offers at 350 fr.

Semi-Finished Material.—Stocks are low. Deals have been concluded at the following prices on the inland market (for basic steel): Blooms, 380 fr.; billets, 420 to 440 fr.; sheet billets, 435 fr. These prices represent an increase of 50 to 60 fr. on October and November quotations.

Beams.—Producers of beams, who have orders in hand for the next 10 or 12 weeks, have not yet determined upon their future price policy. However, 470 fr. at Lorraine works seems to be the average price. The base price of the Comptoir Sidérurgique was 475 fr. delivered.

At a meeting last week of the members of the former Comptoir Sidérurgique, the question of the re-establishment of the Comptoir, but for beams alone, was discussed, but no action is probable at present.

Rails.—An effort is now being made by producers to raise the price of rails; but there is strong opposition by the consumers, who show a united front.

Sheets.—The passing away of the Comptoir des Tôles et Larges Plats at the end of December is deplored, and negotiations are now under way for the re-establishment of the Comptoir for medium and light sheets alone. A meeting was held last week but was adjourned to a later date, when a decision will probably be made. France is a comparatively small producer of medium and light sheets and, therefore, the inland market of these products can be easily controlled. But heavy sheets, on the contrary, are produced in excess of the present demand, and the Comptoir was dissolved because an outside company which had just started a modern rolling mill of large capacity persistently declined to enter the Comptoir.

Meanwhile, the former members of the Comptoir des Tôles have decided to discontinue quoting delivered prices, but to quote f.o.b. works. The following were those most recently quoted f.o.b. Lorraine works:

	Fr. Per Metric Ton
Flats	490 to 530
Sheets:	
Heavy	520 to 550
Medium	600 to 640
Light	820 to 860

Except for light sheets, which are from 30 to 60 fr. higher, the foregoing prices do not differ greatly from the quotations of the former Comptoir.

Rolled Merchant Products.—Available supplies of rolled merchant products are restricted and prices have tended toward the base of 500 fr. corresponding to a coke price of 110 fr. and varying with it. Prices of from 480 to 510 fr., for delivery within two or three months, have been quoted f.o.b. Lorraine or Saar works. In the North of France 485 fr. for rounds, 520 fr. for flats, 615 fr. for hoops and strip, all open-hearth steel, are the latest prices quoted. Wire rods are quoted at 560 to 570 fr. f.o.b. works in the East.

Scrap.—The scrap market is quiet and holders of stocks are endeavoring to check the fall of prices due to the prohibition of exports except to Italy.

French Companies Awarded Foreign Contracts

The Siamese Government recently awarded 10 locomotives and tenders to the French Société de Constructions des Batignolles. Porto-Alegre, Brazil, has placed 70,000 meters of water pipe with two French companies.

GREAT BRITAIN'S PROGRESS

Iron and Steel Industry in Better Condition—Heavy Exports

WASHINGTON, Feb. 13.—In an exhaustive report on "Iron and Steel Industry in Great Britain; Progress in 1922; Problems and Prospects of 1923" made to the Department of Commerce by Assistant Trade Commissioner H. B. Allin Smith, London, an intimate sketch is given of Great Britain's iron and steel position up to the end of 1922 and it is declared that without being a profitable year in the financial sense, it has none the less been a progressive one. Internally, it is pointed out, the industry has "stripped for action" so to speak, ridding itself of many hampering disadvantages brought about by the war period, so that it stands for whatever of productivity and trade 1923 may demand.

The report declares that the external are the main problems for the present. The steps that are taken internationally for a stabilization of world economic affairs, in the opinion of Mr. Smith, will go far to determine whether British industries in general, but iron and steel particularly, are to advance steadily beyond the gains which marked the end of 1922 or are to move still haltingly to some half-way recovery. It is pointed out that peaceful commerce under normal lines would react comfortably and favorably upon shipbuilding in Britain and so rejuvenate the large dormant demand for British steel. Better employment would then yield higher wages once again and quicken the business pulse throughout the country, the report states, dependent primarily upon the settlement of reparations and debt questions. A second major item is declared to be home taxation of industries. The sooner local and imperial taxes are modified, it is stated, the better for all of Britain and especially for iron and steel undertakings.

Mr. Smith says that among related parts of the steel industry a considerable extent of amalgamation has been effected, but that there are relatively few large, modernized, highly economical productive units in the country. It is not expected that the larger amalgamated companies will reach wider in their attempt in controlling sources in markets until trade in volume has tested the soundness of their present positions.

"A fresh start under favorable circumstances is the opening prospect of 1923," says the report. "A good foundation is laid for recovery of operations, possibly up to 75 per cent of capacity during the year, on the new basis of liquidated internal costs, strengthening prices and improving foreign trade, mingled with substantial hopes of a reduction in taxation and a better tendency in international affairs."

In discussing the heroic effort toward readjustment on the part of the British iron and steel industry, Mr. Smith points out that production of pig iron in 1922 totaled 4,899,500 tons and of steel ingots and castings 5,831,900 tons, comparing with respective tonnages of 10,260,000 and 7,664,000 in the pre-war year of 1913 and 8,007,000 and 9,056,000 tons in 1920. The report points out that the first rank in export steel trade went to Great Britain in 1922, amounting to 3,401,115 gross tons, as compared with imports totaling 881,782 tons.

The report says that 1923 is likely to finish the process of adjustment by an early small rise in wages, prices, and other items now under 150 per cent, as compared with 1913, along with some further cuts of freight and shipping costs, so that all of these factors will stand approximately on a level of 50 per cent above 1913 before 1924 arrives. The hope, it is said, lies therefore not in further liquidations within the industry but rather in the possibility of external aid.

BRITISH FOREIGN TRADE

December Steel Exports Still Heavy—Year's Exports Thrice Those of 1921

The December official data on British foreign trade in steel and iron show that the total exports were 353,728 gross tons, or next to the largest since July, 1920, when they were 393,016 tons. This is a decrease of 30,270 tons from November. The December exports make the average for the year 295,980 tons per month. Exports of scrap are included. This year's total exports were 3,551,761 tons against 1,735,077 tons for 1921.

The December imports were 118,460 tons, or the largest for the year. The year's total was 986,606 tons compared with 1,827,301 tons in 1921. These data also include scrap. The following table shows comparative data:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
October	354,595	100,252
November	383,998	85,659
December	353,728	118,460
Aver. per month, first quarter, 1922	267,047	82,536
Aver. per month, second quarter, 1922	274,830	67,795
Aver. per month, third quarter, 1922	274,347	74,360
Aver. per month, fourth quarter, 1922	364,107	101,457
Aver. per month, 1921	144,885	152,734
Aver. per month, 1920	274,881	128,685
Aver. per month, 1919	188,519	50,801
Aver. per month, 1913	420,757	195,264
Aver. per month, 1922	295,980	82,215

Principal British Exports, Gross Tons

	Average per month		December	
	1913	1921	1921	1922
Pig iron	78,771	8,602	12,251	81,363
Steel rails	41,676	14,698	27,829	23,825
Steel plates	11,162	10,673	4,953	9,726
Galvanized sheets	63,506	17,635	45,086	47,906
Steel bars	20,921	8,927	10,863	28,205
Tin plates	41,208	18,873	30,425	43,023
Black plates	5,679	1,178	2,836	3,276
Steel sheets	....	....	7,933	18,274
Total exports, 1922				3,551,761
Total exports, 1921				1,735,077

Pig iron imports in December were 19,504 tons. For the year they were 12,810 tons per month, which compares with a monthly average in 1921 of 55,564 tons.

Iron ore imports in December were 380,275 tons, which compares with a monthly average in 1921 of 157,298 tons. The 1922 imports were 289,387 tons per month. Manganese ore imports in December were 42,686 tons. Last year they were 28,109 tons per month, in 1921 they were 14,405 tons per month, and in 1913 they were over 50,000 tons per month.

Place of the Electric Brass Furnace

There are some points on which the path of progress of electric brass furnaces is fairly clear, states the Bureau of Mines in a recently issued bulletin. Mechanical refinements, use of automatic electrode control, in batteries of arc furnace, and a slow but general improvement in life of refractories may be looked for as experience is gained. There are, however, many points of interest on which there is not yet enough collected experience to allow prediction. The electric furnace has not yet displaced the fuel-fired furnace from the field, nor will it do so completely in the near future, if ever. But it does seem certain that in the great majority of cases the electric melting of brass is both the best and the cheapest method, and that electric furnaces, by their sheer superiority of service, must be ultimately destined for a dominant place in brass melting.

Foreign Trade Opportunities

Kyle Palmer & Co., 7 Foch Avenue, Kuala Lumpur, Federated Malay States, desires information from American manufacturers of pig iron, pipe, steel bars, steel shafts, steel plates, rivets, bolts, nuts, etc., having in mind the sale of the products in the Malay States.

Rosenfeld, Hillas & Co., Pty., Ltd., 400 Collins Street, Melbourne, Australia, wishes to hear from American manufacturers of builders' hardware with a view to selling such products in Australia.

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ESTABLISHED 1855

THE IRON AGE

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High Rate of Steel Production

There was a sudden increase in January in the production of steel ingots, the increase over the December rate being nearly 10 per cent, while the increase over the fourth quarter is the same, since production had been at substantially a uniform rate during the three months. The increase over the average rate in 1922 was between 25 and 30 per cent.

Study of the varying rate of steel production is simplified by the use of relatives, but the basis or "normal" cannot be set with confidence, for as demand goes through its wide swings, the view as to what rate is natural and what rate must be regarded as exceptionally high or exceptionally low is likely to change. Seeing that the production in 1920 was less than 1 per cent different from the average of the five years 1916 to 1920, including the relatively lean year 1919, there is some reason for taking it as 100. On this basis, production of steel per working day by the 30 companies reporting their output monthly to the American Iron and Steel Institute has varied as follows:

	1920	1921	1922	1923
January	99	78	56	109
February	108	66	66	...
March	111	53	79	...
April	92	42	88	...
May	101	44	91	...
June	104	35	92	...
July	98	29	90	...
August	105	38	74	...
September	105	41	83	...
October	105	56	100	...
November	92	58	101	...
December	81	50	101	...
Year	100	49	85	...

The percentage of production to estimated capacity may be obtained, roughly, by taking seven-ninths of the figures given in the above table.

Production of the steel industry as a whole cannot be computed precisely from the figures supplied by the 30 companies reporting monthly, because the reporting and the non-reporting companies do not always run at the same rate. In 1920 the reporting companies supplied 84.2 per cent of the total ingot output, and in 1921 they supplied 87.5 per cent. The variation was caused partly by small companies paying unusual prices for scrap, pig iron or coke in 1920, thus being able to run at higher rates than the Steel Corporation, partly by the Steel Corporation being much better supplied with orders in the early part of 1921 than were most of the independents, and partly by other factors.

As the total ingot production in 1922 has not yet been ascertained, the 30-company percentage for 1922 is not known. The reported output last month was 3,251,694 tons. If this was 86 per cent of the total production, ingots were produced at a rate of 43,500,000 tons a year, and this is probably within half a million tons of the actual fact.

In 1917 and 1918 steel production was substantially equal to the 43,500,000-ton rate now shown for January, while 1916 had an output a trifle above 41,000,000 tons. Since the armistice, only March, 1920, has shown as high a rate as last month. The definite prospect, however, is that this month will show a higher rate still, and as March is almost invariably a particularly good month for tonnages, a fresh record rate may be shown. This would be no criterion for the year, however. Labor shortage, pronounced just before winter came, will probably be a greater limiting factor still in the spring. No doubt one factor influencing buyers to take heavy steel deliveries so freely now is fear that labor shortage will interfere later.

The Basing Point Hearings

As the many legalistic objections raised by attorneys in the basing point hearings held the past two weeks at the offices of the Federal Trade Commission may have proved confusing to readers of the reports of the proceedings which have been published in THE IRON AGE, the report published this week, reviewing the situation up to date and interpreting the proceedings, will be found of peculiar interest. Two features are worthy of special attention.

The purpose of the exhibits as entered by the Steel Corporation was evidently to show that the prices vary according to market conditions in the Chicago district. To show that the Illinois Steel Co. prices did vary and that they did not at all

times equal the Pittsburgh basing price plus the full freight to destination, it was essential that some standard be referred to for purposes of comparison. THE IRON AGE quotations were selected to form a basis of comparison. This action was the latest formal recognition of THE IRON AGE as the leading authority on prices. No one, and certainly not THE IRON AGE, has ever contended that market reporting is an exact science, or that one price can be named as *THE* price at which every buyer can place an order at a certain time for early or late delivery, but the very great value of THE IRON AGE quotations, which has been established through many years, during which contracts amounting to millions of dollars have been based upon them, is reaffirmed by the use made of them in the hearings at Chicago. Whether the liberal policy of the examiner shall prevail or strict construction be adopted and the quotations excluded in future proceedings is not certain, but it is certain that no better authority as to prices will be obtainable from a source not controlled by either buyer or seller.

Another important feature was developed in the testimony of Mr. Mills, showing that trade paper quotations, particularly those of THE IRON AGE, are sometimes used by the Steel Corporation in making contracts for future delivery. This testimony indicates that the custom has been adopted to a greater extent than has been generally known.

Regardless of what may be the decision ultimately as to the Pittsburgh basing method, it is evident that some facts relating to policies and customs are being developed which may become very useful in improving business methods.

Supplies of Ferromanganese in 1923

American producers of ferromanganese are likely to have a busy year, if steel production continues at its present volume. According to data so far available, stocks of the alloy left over from 1922 cannot be heavy. The 1922 steel output of at least 34,350,000 gross tons, including castings, would theoretically require about 260,690 gross tons of ferromanganese at 17 lb. to the ton. To meet this there was available in 1922 a total of about 246,175 tons, made up of 151,175 tons of domestic production and about 95,000 tons of imported product. This indicates a slight deficiency or at least no surplus.

The January steel output was at the striking rate of not less than 45,000,000 tons per year. To satisfy such a rate, assuming the year's total to approximate so large a volume, there will be needed theoretically 340,000 tons of the manganese alloy. Imports may not exceed 100,000 tons, in which case the domestic furnaces will have to produce at 19,000 or 20,000 tons per month. According to the January blast furnace statistics of THE IRON AGE, published last week, the production that month was 19,358 tons or the largest in 22 months.

There is also the possibility that the British industry may not be able to furnish as much this year as last. Even in 1920 only about 60,000 tons was imported. The heavy receipts last year were anticipatory of the tariff. Even in 1913, when domestic production was light, imports were not in excess of 128,000 tons, which constitutes the record. Thus, under the least favorable conditions so far as foreign competition is concerned, a busy year is forecast for American producers even with only an approach to the steel production rate at which the year begins.

Need for Timely Cost Data

Returns from the 1921 census of the machine tool industry show, on analysis, something of the handicap under which that industry has operated since the heydays of 1920 and point once more to the vital necessity for adequate, accurate and timely cost data. Each wage earner received in 1921 about $1,185, on the average, as compared with $1,246 in 1919. But the wage payments per $1,000 of product, $311.60 in 1919, rose to $372.80 in 1921. Still worse, the salary payments per $1,000 of products, $85 in 1919, were $177.35, or more than twice as much, in 1921. This shows the inevitably exaggerated effect of overhead in times of depression.

Using the average wage earner as the basis of computation, the value of products turned out per man in 1919 was $3,999; in 1921, $3,178. Deducting the cost of materials and of contract work and the amounts paid in wages and salaries, the "margin" left, out of which the manufacturer had to pay his taxes, light, heat and power bills, rent, interest, insurance, freight and all other expenses, before he could figure a profit, was $294 per wage earner in 1921, against $1,274 in 1919. As 1919 was not far out of line in this particular, the distressing situation in 1921, with less than one-fourth as much "margin," stands out in bold relief.

Post-War Readjustment in Coal

Right after the armistice the War Industries Board adopted a scheme to present 50 studies of pre-war and war-time prices of commodities. One of these commodities was coal, the study being made jointly by the Geological Survey and the Fuel Administration. The report, a pamphlet of 115 pages, was written by C. E. Lesher, then of the Geological Survey, now editor of *Coal Age*.

A sentence in the prefatory note makes interesting reading, in view of what has since happened in coal. The note says: "The aim of these studies is both to make the price quotations gathered by various Government agencies available to men concerned with problems of business readjustment and also to provide a permanent record of the great revolution in prices that accompanied the World War."

The idea was that there had been a great advance in prices during the war and that after the war—the report is dated Aug. 29, 1919—there would be a readjustment. What has been the "readjustment" in coal?

The War Industries Board study took coal prices July 1, 1913, to July 1, 1914, as base and made comparison of prices through December, 1918. Coal was then on the threshold of its new

experience, in the period of "business readjustment" that was to follow the war. The record since the war is furnished by an index prepared by *Coal Age*, on the same principle as that employed in the study just referred to. Fourteen coals, representing nearly 90 per cent of the country's output, are weighted according to tonnage importance, and the average price July 1, 1913, to July 1, 1914, is taken as 100. The highest monthly average of spot prices in the war was for June, 1917, 297, while in 1920 the top was at 725. In the war year 1918 the average realization on all coal, including contract deliveries, was set at 218, while for the week of Feb. 5, 1923, the *Coal Age* index is 312. Thus has coal conducted itself in a period of more than four years of "readjustment."

Coal has been bringing such high prices since the war that the memory of the prices at which coal used to sell has been dimmed. It may be well for us to refresh our memories. From statistics in the Geological Survey and Fuel Administration study, the following figures are taken, annual averages of spot prices of three of the 16 coals given and of the weighted coal, representing all production:

Annual Averages of Spot Coal.

	1913	1914	1915
Pittsburgh	$1.27	$1.17	$1.04
Western Kentucky	1.00	0.90	0.92
Pocahontas	1.34	1.23	1.22
All coal	1.29	1.22	1.19

These figures certainly look queer in the light of figures given in reports of the coal market during the past few years. It is often remarked that the price of coal must be high because there are too many miners and too many coal mines. Coal is assumed to be an exception to the general law of supply and demand, the law of competition, under which the world is supposed to be transacting its business.

Our Steel Exports Last Year

The checked flow of American steel to foreign consumers is one of the unusual features of the 1922 record in the face of an increased steel production of 70 per cent over 1921. The Government's data show that the iron and steel exports last year averaged 165,500 gross tons per month. They were not only the lowest since the war but were only about two-thirds of the 1913 movement of 241,000 tons per month. It is something of an anomaly that, in a year of extreme depression such as 1921, our exports exceeded those in a year of moderate prosperity, such as 1922, though, of course, 1921 had a large carry-over from 1920. In 1913, with a steel output considerably smaller than last year, our steel exports were 50 per cent larger than last year.

Despite the small total exports last year, the foreign sales of two important commodities nearly reached pre-war volume. In 1913 our exports of galvanized sheets and tin plates averaged 9500 tons and 6100 tons per month respectively. In 1922 the foreign movement was about 9100 tons of the former and 6400 tons per month of the latter.

The loss in foreign trade by American sellers has been the gain of British producers, but exchange has been a factor. In strong contrast stands the British record last year at 295,000 tons per month against 414,100 tons per month for 1913 and twice the 1921 rate.

In the face of insistent demands at home, adverse exchange in foreign competition and a none too great world demand, the way of the exporter has not been easy. Much that was sold in 1922 represented serious losses in the effort to retain foreign consumer relations and the problem now is to keep that same relation with minimum losses until exchange righting and increased demand puts foreign trade on a more rational basis than it is today.

Overheated Factories

The commission of scientific experts appointed by the Governor of New York in 1913 to make a comprehensive study of the problems of ventilation of industrial plants, school houses and other buildings where people congregate, has submitted a report of five years of investigation. This included extensive laboratory tests, using a specially constructed experimental chamber, in which human beings were subjected to varying conditions of atmosphere. A conclusion which should arouse much interest is that the greatest factor of all in producing debilitating, slowing-up results is not, as is still commonly assumed, the presence of an excess of carbon dioxide and otherwise lack of freshness of the air, but excessive heat, which is defined as a temperature above 68 deg. Fahr. The ill effects of heat are accentuated by high humidity, which in crowded rooms results from the emanations of human bodies.

In considering the subject from the standpoint of shop or factory, excessive humidity seldom exists. On the contrary, extreme dryness is usually characteristic of atmosphere in the months when windows are kept closed. Dry air of itself is not an influence in producing nervousness and irritability, according to the report. Impure air is a menace, of course, but is of secondary importance.

Temperatures over 68 deg. were found to increase the pulse, respiration and blood pressure and to lower "the tone" of the circulatory system, "exposing the individual to respiratory diseases on passing into lower temperatures." The report at the same time condemns ventilation by means of open windows, unless modified by the use of special devices, for drafts produce the same effects as those which come from passing from a hot to a cold atmosphere.

Many factories are overheated, either because the heating apparatus is not under control, or because no one assumes the responsibility of adjusting the apparatus to the weather. Offices, too, are maintained at a temperature under which employees wilt as the day progresses. In some cases the reason for undue heat is the use of long stretches of pipes which form a part of the condensing system of the power plant, steam passing through them constantly, regardless of outdoor temperatures.

The thermometer, the New York commission

asserts, is the most important instrument which could be installed, as a measure of physiological and psychological well being, in a shop or factory or any other assembling place of human beings. The employer should keep in mind the proved fact that his loss of employees' time through sickness is very much the highest in the months when his factory windows are closed, and the reason for the high rate is the prevalence of respiratory diseases. If these are fostered by too much heat, then the mercury is worth watching.

CORRESPONDENCE

Attitude Toward the Purchasing Agent

To the Editor: Notwithstanding that until comparatively recently in business history the purchasing agent was regarded as non-existent, he has always been with us. It is true that with a certain few exceptions he did not function properly, but this was due to two things: Either through failure on the part of the management properly to visualize the work, he was merely an order placer, or the purchasing was done by one who did not appropriate to himself the title of purchasing agent. This individual was usually the head of the concern, and having retained direction of sales or financing, because they were of too much moment to be intrusted to anyone else, also did the buying because he considered it too small a matter to pay another man to supervise.

This type of man exists today and he all too frequently breaks into print with a strongly worded story of the inefficiency of purchasing agents and proudly states that he has never dealt with them. As a matter of fact, that proud statement means only three things: First, having never dealt with them, he is in no position to pass judgment upon their efficiency or inefficiency. Second, the people who are his customers have no purchasing agent and are therefore inefficient in that there is no one in the organization with the necessary training to deal advantageously with him. Third, he, of course, has no purchasing agent in his own organization, and is therefore at the same disadvantage in relation to those of whom he is a customer.

It is not necessary to go into detail to show that in these days a specialist in buying is as vital to an industry as a specialist in any other line of activity. Those gentlemen who are always so anxious to prove the contrary are invited to show where any executive utilizing the services of a real purchasing agent has rushed into print and expressed regret for so doing.

It would be prejudicial to the excellent work which is being done by the purchasing profession as a whole to claim that the individuals make no mistakes. But one wonders why, of late, there has been so much effort expended to prove that the purchasing agent is a non-essential, or at least a not very lively asset. As the criticism mainly comes from those who are interested in the selling end of the game and not from the employers, the purchasing agent should feel highly complimented.

Probably the most frequent count brought against the purchasing agent is overloading the inventory, and yet in the majority of cases where this occurs, it is due to the insistence of someone higher in authority who has been dazzled by a wonderful pictured sales program. As neither sales nor production program means anything if materials cannot be procured at the right time and right price, the counsel of the purchasing agent should be sought and his buying policy be as unhampered as that of the other department heads.

There is another angle from which to view this question of the efficiency of the purchasing agent. How many of the actual heads of manufactories help the purchasing agent to be of greater value in his position? Men who are rightfully reputed to be of broad vision and activity, wishing only to formulate policies, leaving the working out of the details to subordinates—selling to the sales manager, production to the works manager, design and research to the engineer, etc.—leave buying to chance. Whether or not there is a profit at the end of the year, they give no thought to the effect which the purchasing may have had on this net result.

The membership of the National Association of Credit Men is well over 30,000. There are engineering societies covering every branch of that profession and the aggregate membership runs into the thousands. Chambers of Commerce, manufacturers' associations and other bodies of co-ordinated activity abound. In addition to the well-known schools of salesmanship, many companies maintain their own instructive courses, tacitly recognizing that the concrete form of sales resistance is the buyer. And yet the membership of the National Association of Purchasing Agents is only approximately 4000.

This is exhibit A in the evidence of indifference and is not a matter of objection to the nominal burden of membership dues but a mistaken and sometimes fatal blindness to the need of developing an important member of the body industrial.

Mr. President or General Manager, wake up to the number of those who are every day selling to you more successfully than you are buying from them and find the honest answer to the question, "If my purchasing is inefficient, whose fault is it? H. D. MURPHY.

Employee Representation Discussed

Industrial representation plans, including those of the Colorado Fuel & Iron Co., Denver, with which he was formerly connected, were outlined by E. S. Cowdrick at a meeting of the New York chapter of the Society of Industrial Engineers, held in New York Feb. 12.

The present shortage of labor throughout the country, affecting particularly the steel industry, was discussed and pointed to as undoubtedly causing increased interest on the part of the higher executives in industry in the whole subject of labor relations. Industrial representation plans as providing a mechanism for establishing confidence between the employees and management was brought out in the discussion.

That workmen must look askance at any plan in which the company had the final say in a vital issue and that to be fair provision must be made that both sides abide by the final rulings of an impartial body, were emphasized by Dr. Joseph W. Roe, president of the society, in the discussion. The test of the genuineness of the whole thing was, he said, the question of the final authority.

In the case of the Colorado Fuel & Iron Co. appeal may be made to the State industrial commission. An interesting fact brought out was that in the plan of the Colorado company only one of the four committees handles grievances; the others deal with matters of safety, welfare, sanitation, housing and education. The latter were emphasized by Mr. Cowdrick as being constructive activities that not only resulted in improved confidence but also in greatly improved conditions.

Agreeably to the suggestion contained in the message of the Governor of Wisconsin at the opening session, the Wisconsin Legislature at Madison has received a bill introduced by Assemblyman L. H. Allen of Superior, Wis., appropriating $15,000 to finance the work of a committee consisting of the Governor and the Attorney General to "have full power and authority, and to be charged with the duty of protecting the interests of the people of the State of Wisconsin against the steel trade practice commonly known as 'Pittsburgh Plus,' and other similar practices and bringing about their abolition."

On Jan. 1, last, unfilled orders on the books of the Consolidated Machine Tool Corporation of America aggregated $1,125,000.

Iron and Steel Markets

MORE PRICE ADVANCES

Semi-finished Steel, Sheets, Wire and Nails Included

Indications of Period of Two Price Standards —To Increase Pittsburgh Production

Recent happenings in the steel market show that the filled order books of Chicago district mills have forced the selling center east of Pittsburgh. Under the surface is an intensified desire for mill protection, both for delivery and for price, and now the East is finding diminishing capacity for second quarter shipments. Prices have further stiffened and on transactions of relatively little moment varying premiums have been paid.

Indications are that a double standard of prices, like that of 1920, may obtain. It is already apparent in plates and wire nails. Purchases at today's minimum commonly carry no promise of definite delivery, and while the attitude of the larger producers is against two sets of prices, buying pressure is encouraging a higher level when mill space allows for early shipments.

There is reason to believe that large regular buyers have lately obtained protection for the second quarter at a 2.15c., Pittsburgh, basis, for steel bars. This is significant in the light of the usual $1 a ton concession on attractive mill business.

The week's advances include $3 a ton in black and galvanized sheets, $1 in blue annealed sheets, $2 a ton in plain wire and wire nails by the Steel Corporation and as high as $4 in wire and $6 in nails by some other makers. Nails promise to be strong at $2.80 a keg, seeing that this is only 15c. more than the plain wire cost and the keg itself costs 16c. A general advance of $3 a ton to 2.90c. has been made in hot-rolled strip steel; a $5 advance has been made in cold rolled strip, and light and narrow hoops are quoted at 3.50c., or $5 up.

More is heard of buyers trying for heavy bookings, with the mills accepting only a portion of the offerings, thus to prevent overbuying. Jobbers are finding much coming their way that would ordinarily go to the mills, and their prices in the face of depleted stocks are strengthening.

Increased melt of foundries, disappearance of steel companies as active competitors of merchant furnaces and the probability that there will be little, if any, more importing of foreign iron are factors giving strength to the pig iron market. Prices of furnace coke have declined only slightly and the coke situation promises to have less influence on pig iron than was expected.

Buying has been active in New York, Cleveland and other centers, and steel making grades have advanced 50c. in the Mahoning Valley. In the South $24.50, Birmingham, was the lowest price recently made and $25 is generally quoted. Leading merchants at Chicago have marked up prices 50c., but the new schedule has not been established. Stocks in the South were reduced 22,000 tons last month, although the production record was the greatest for any month since 1917.

Operations will shortly be increased by the blowing in of three blast furnaces, perhaps more, by the Carnegie Steel Co., and the two Youngstown steel companies are making ready to start each another furnace. Inadequate coke deliveries are interfering with expansion in Chicago. There it is feared the withdrawal of labor in the spring will counterbalance the betterment of transportation and increase in production is as yet doubtful.

January's indicated steel ingot production was close to 140,000 tons a day, 8½ per cent better than December (compared with less than 5 per cent increase in pig iron), a rate of about 43,500,000 tons per annum, exclusive of steel castings, and representing an operation of about 84 per cent of the country's capacity.

Oil tank awards of the week called for 16,300 tons. For a building in Philadelphia, 6000 tons of structural steel was closed, and fresh inquiries included 7500 tons for the Inland Steel Co., for an open-hearth plant addition and a mill for merchant bars and strip steel, and 10,000 tons for the Commonwealth Edison Co. in Chicago.

Motor truck manufacturers are reaching a large production basis. The Ford Motor Co. has ordered 25,000,000 hexagon nuts in Cleveland and is closing for second quarter needs with regular sources of supply of parts. To maintain schedules, a premium of $15 a ton has been paid on sheets.

A further blowing out of blast furnaces marks the European situation, but Belgium has resumed quotations on merchant bars for February and March delivery. Germany is reported negotiating for 1,000,000 tons of Wabana ore.

Pittsburgh

Mills Very Conservative—Pig Iron Market Shows Strength

PITTSBURGH, Feb. 13.—Indifference of steel makers, notably the Steel Corporation, toward additional business on account of their already sold up condition seems only to whet the desire of buyers to get onto mill order books. With the Steel Corporation already sold out for the first half of this year, acceptance of more business would amount to little more than protection against third and fourth quarter tonnages at today's prices. The independent companies are all heavily committed against production during the current quarter and are not yet ready to enter much second quarter business until they know more about labor supplies and probable costs. Under these circumstances those who must have supplies find sources exceedingly few and of necessity must pay the prices demanded. In the past week, definitely higher prices have appeared in sheets, wire products, hot-rolled flats and there is such a dearth in

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 13, 1923	Feb. 6, 1923	Jan. 18, 1923	Feb. 14, 1922
No. 2X, Philadelphia‡	$29.76	$29.76	$29.76	$21.34
No. 2, Valley furnace†	27.00	27.00	27.00	18.75
No. 2, Southern, Cin'ti†	**28.55**	28.05	27.05	20.00
No. 2, Birmingham, Ala.†	**24.50**	24.00	23.00	15.50
No. 2 foundry, Chicago*	29.50	29.50	29.00	18.00
Basic, del'd, eastern Pa	28.00	28.00	28.00	19.84
Basic, Valley furnace	**26.00**	25.50	26.00	17.75
Valley Bessemer, del. P'gh	**29.77**	29.52	29.27	19.50
Malleable, Chicago*	29.50	29.50	29.00	18.00
Malleable, Valley	27.00	27.00	27.00	19.00
Gray forge, Pittsburgh	28.27	28.27	28.27	20.71
L. S. charcoal, Chicago	33.15	33.15	33.15	30.50
Ferromanganese, furnace	107.50	107.50	107.50	62.50
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$40.00
Bess. billets, Pittsburgh	**40.00**	38.50	37.50	28.00
O.-h. billets, Pittsburgh	**40.00**	38.50	37.50	28.00
O.-h. sheet bars, P'gh	**40.00**	39.50	37.50	29.00
Forging billets, base, P'gh	45.00	45.00	43.00	32.00
O.-h. billets, Phila	45.17	45.17	43.67	33.74
Wire rods, Pittsburgh	**50.00**	47.50	47.50	36.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb	**2.20**	2.10	2.00	1.50
Light rails at mill	2.15	2.15	2.15	1.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.475	2.475	2.325	1.76
Iron bars, Chicago	**2.50**	2.35	2.35	1.60
Steel bars, Pittsburgh	2.15	2.15	2.00	1.40
Steel bars, Chicago	**2.25**	2.10	2.10	1.55
Steel bars, New York	2.44	2.44	2.34	1.78
Tank plates, Pittsburgh	2.20	2.20	2.10	1.40
Tank plates, Chicago	**2.35**	2.30	2.30	1.55
Tank plates, New York	2.54	2.54	2.44	1.78
Beams, Pittsburgh	2.15	2.15	2.10	1.40
Beams, Chicago	**2.35**	2.20	2.20	1.55
Beams, New York	2.49	2.49	2.44	1.78
Steel hoops, Pittsburgh	**2.90**	2.75	2.75	1.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Feb. 13, 1923	Feb. 6, 1923	Jan. 18, 1923	Feb. 14, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	**3.50**	3.35	3.35	3.00
Sheets, galv., No. 28, P'gh	**4.60**	4.35	4.35	4.00
Sheets, blue an'l'd, 9 & 10	**2.65**	2.60	2.50	2.25
Wire nails, Pittsburgh	**2.80**	2.70	2.70	2.40
Plain wire, Pittsburgh	**2.65**	2.55	2.45	2.15
Barbed wire, galv., P'gh	**3.55**	3.35	3.35	3.05
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$4.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	$27.00	$27.00	$27.00	$15.00
Carwheels, Philadelphia	**25.00**	24.00	23.00	15.00
Heavy steel scrap, P'gh	**23.00**	22.50	22.00	13.50
Heavy steel scrap, Phila	20.00	20.00	20.00	12.00
Heavy steel scrap, Ch'go	19.75	19.75	19.25	11.25
No. 1 cast, Pittsburgh	**25.00**	24.00	23.00	16.00
No. 1 cast, Philadelphia	24.00	24.00	23.00	16.50
No. 1 cast, Ch'go (net ton)	23.00	23.00	21.50	13.00
No. 1 RR. wrot., Phila	**25.00**	24.00	23.00	14.50
No. 1 RR. wrot., Ch'go (net)	18.00	18.00	18.00	10.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	*$7.00*	$7.50	$8.00	$2.90
Foundry coke, prompt	8.50	8.50	8.50	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**15.25**	15.12½	14.87½	13.25
Electrolytic copper, refinery	**14.87½**	14.75	14.50	13.00
Zinc, St. Louis	7.05	7.05	6.87½	4.50
Zinc, New York	7.40	7.40	7.22½	4.85
Lead, St. Louis	8.10	8.10	7.75	4.40
Lead, New York	8.10	8.10	7.95	4.70
Tin (Straits), New York	**41.25**	40.12½	38.75	30.75
Antimony (Asiatic), N. Y.	7.12½	7.12½	6.75	4.40

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Feb. 13, 1923, Finished Steel, 2.596c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Feb. 6, 1923,	2.560c.
Jan. 16, 1923,	2.474c.
Feb. 14, 1922,	2.005c.
10-year pre-war average,	1.689c.

Composite Price, Feb. 13, 1923, Pig Iron, $26.96 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Feb. 6, 1923,	$26.63
Jan. 16, 1923,	26.63
Feb. 14, 1922,	18.02
10-year pre-war average,	15.72

semi-finished steel that we feel justified moving the quotation to $40 for rolling forms, since it is evident that less than that price no longer can be done.

Although reports from all steel making centers tell of new high record marks in production, there seems to be no appreciable increase in available supply and several companies have plans on foot to further increase production. The Carnegie Steel Co. blew in a furnace last Saturday at its Edgar Thomson works and will light another Feb. 15, and still another on Wednesday or Thursday of next week. The second Lucy furnace goes in tomorrow. It is understood that this company also is considering putting on another Pittsburgh city furnace and one in the Youngstown district, the latter to provide additional hot metal for its Youngstown works. There is some talk that it may possibly start up its Columbus, Ohio, furnace and steel works to help out the steel supplies of the American Sheet & Tinplate Co. unit in Ohio and Indiana. The Republic Iron & Steel Co. is making ready to put on its Hannah Furnace, Youngstown, and the Youngstown Sheet & Tube Co. soon will blow in the old Brier Hill Tod furnace. Another Cambria Steel Co. furnace at Johnstown is expected to go in shortly and a Bellaire, Ohio, stack of Carnegie Steel Co. is near the resumption stage. Today there are only 32 idle furnaces out of a total of 138 in this and nearby districts.

Although the coke market has weakened on furnace grades since a week ago, the possibility of very low prices being reached is dimmed by the large number of blast furnaces in blast or going in, and based on one good sized tonnage for second quarter, it now looks as though prices for this period would be well up to the first quarter contract average.

The pig iron market is getting stronger. Scrap does not get any cheaper despite a lack of buying in this district and with the prospect of labor shortages ahead the industry as a whole seems face to face with even higher costs than prevail today.

Pig Iron.—This market finally seems to be catching the stride of the steel situation, and there has not only been a noticeable quickening in demand, but price ideas of producers are strengthening, especially as indications now are that cheap coke is doubtful in the second quarter. The possibility of an advance in ore prices also is an influence. The market has gone to $26, Valley furnace, for basic grade, since a week ago, several sales, one including 2500 tons, having been made at that price, and sales to Ohio melters aggregating in the neighborhood of 40,000 tons, lately have been made at the equivalent of $26, Valley furnace. The market also is stronger on Bessemer iron, which

now is not quotable at less than $28, Valley furnace. Several small sales have been made at that figure. Inquiries for second quarter foundry iron have been numerous lately, particularly on the part of the sanitary ware manufacturers. One of these interests recently bought 10,000 tons of Southern iron at $24.50 to $25, Birmingham, for the base grade, and is now considering the purchase of a like tonnage of Northern iron. While small lots of foundry iron have sold at $28, furnace, for the base grade, for early delivery, the market is not yet quotable above $27 on round lots; indeed, there was a recent sale at $26.50. The market on malleable iron is rather indefinite in absence of sales. We note sales of low phosphorus copper free iron in the past week aggregating about 1000 tons at recent quotations.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$26.00
Bessemer	28.00
Gray forge	$26.50 to 27.50
No. 2 foundry	27.00 to 28.00
No. 3 foundry	26.50 to 27.50
Malleable	27.00 to 28.00
Low phosphorus, copper free	35.00 to 36.00

Ferroalloys.—Entrance of the Cambria Steel Co. into the market as a source of supply of speigeleisen creates an interesting situation in that material since this company, having a much lower freight rate to Pittsburgh and points west than the New Jersey Zinc Co., which hitherto has been practically the sole source of commercial supplies, is naming the same price at Johnstown, Pa., as the latter lately has been quoting f.o.b. Hazard, Pa. The Cambria company is quoting 19 to 21 per cent material at $36, Johnstown, and on one inquiry for 1000 tons for an Ohio maker of alloy steel, that price figures out more than $2 per ton lower delivered than the price named by the Eastern producer. The market still is quotable at $36 to $37, furnace, for single carloads of 19 to 21 per cent material, but sales into this and Western consuming points from the Eastern furnace at these figures are doubtful owing to the freight advantage enjoyed by the Johnstown producer. The market generally is quiet, since consumers generally are well covered and shipments against contracted tonnages are sufficient to meet all current requirements.

We quote 80 per cent ferromanganese at $107.50, f.o.b. Atlantic seaboard, or $112.29 delivered Pittsburgh common freight points for either domestic or British material. Spiegeleisen, 19 to 21 per cent, carloads, $36 to $37, furnace; 16 to 19 per cent, carloads, $35 to $36, furnace, with larger lots lower according to the quantity; Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10; 13 per cent, $56.10; 14 per cent, $61.10; silvery iron, 6 per cent, $34; 7 per cent, $35; 8 per cent, $36.50; 9 per cent, $38.50; 10 per cent, $40.50; 11 per cent, $43.80; 12 per cent, $47.10. The present freight rate from Jackson and New Straitsville into the Pittsburgh district is $3.66 per gross ton.

Semi-Finished Steel.—Recent sales of billets and slabs, one of 6000 tons and another of 2000 tons, both to strip steel makers, at $38.50, Pittsburgh, appear to have cleaned up all available supplies for the present quarter and as a sales basis that price may now be considered as gone. Billets, slabs and sheet bars do not appear to be available at any price for this quarter's delivery and makers are not yet ready to announce prices on second quarter tonnages. As nearly as the market can be appraised, in the absence of sales, it is not below $40, Pittsburgh or Youngstown on these forms. We note a fair-sized sale of slabs to a forging company, unable to obtain forging billets, at $45, Pittsburgh and apparently much more than the quotations on forging billets can be obtained on small lots for early delivery. The wire rod market now is fully established at $50, base, as makers having tonnages for sale have lately found no trouble in getting that price. The last price of the American Steel & Wire Co. was $49.50, base, but the common understanding is that this interest has no rods for sale. Universal pipe skelp has been sold as high as 2.25c., Pittsburgh, and the market on this grade, as well as on sheared and grooved no longer is quotable below 2.20c. Prices are given on page 512.

Plates.—The transition in this product from one of the weakest to one of the strongest in the market is still commented upon. Mills in this and nearby districts have about all the business they can accept for the present quarter and it is difficult for late comers to get on mill books, even at today's prices. The Steel Corporation price of 2.20c., base, Pittsburgh, is absolute minimum and 2.25c. is as low as any of the independent mills now are quoting. Tank and barge inquiries and orders are heavy and a good many plates also are required for the pipe lines, which are being placed. There is business enough to engage all capacity that can be operated at today's prices. Evidence of the shortage here is found in a sale of a small lot for shipment into this district at 2.35c., Coatesville. Prices are given on page 513.

Iron and Steel Bars.—The Steel Corporation still is at 2.10c., base, Pittsburgh on steel bars, but this price is nominal, since it is sold up practically for the first half of the year and is not taking business for future delivery at that level. Bookings made today at the current price would be largely protections against an advance and this the corporation is trying to avoid. Independent mills having any capacity open for reasonably early delivery are not below 2.15c. and the more common quotation is 2.25c. Iron bars are firm at 2.75c., base, for refined iron.

We quote steel bars rolled from billets at 2.10c. to 2.25c.; reinforcing bars, rolled from billets, 2.10c. to 2.25c. base; rail steel reinforcing bars, 2c. to 2.10c.; refined iron bars, 2.75c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—The quotable range is the same as a week ago, but prices are growing stronger in keeping with the general market and 2.20c., base, Pittsburgh, is the going minimum on reasonably early deliveries. The Steel Corporation is at that price and has little tonnage for delivery this side of July 1. Protections at lower prices are said to be rapidly expiring. Fabricating shops in this district, notably those of the American Bridge Co., are well committed, though structural awards in this territory for some time have been few and small. Inquiries are numerous, but it is said that bids are far below what they should be on the present basis of plain material. Plain material prices are given on page 513.

Wire Products.—American Steel & Wire Co. yesterday announced advances of $2 per ton in nails, bright and coated, plain wire and spring wire of $4 per ton in galvanized barbed wire and fence staples and painted barbed wire and polished fence staples and of about $3 per ton in woven wire fence. These changes amount to the adoption of the independent schedules on nails and wire, but in other instances are clear advances to well above recent independent prices. Coincident with the American Steel & Wire Co.'s advance was one by the Cambria Steel Co., about double that of the former. The latter company has gone to $3 base, per keg on nails, against $2.80, the Steel Corporation price, and to $2.75 for plain wire, against $2.65, the new price of the leading interest. There is much confusion as to where the real market is, with the two sets of prices. Youngstown Sheet & Tube Co. and the Jones & Laughlin Steel Corporation have not yet acted, both interests being out of the market at present. All makers have heavy commitments and the pressure for supplies still is heavy. The new Steel Corporation prices may be regarded as minimums on new business and probably will become the prevailing quotations, when those now out of the market again are open for orders. Prices are given on page 513.

Steel Rails.—The drift of the market on light rails rolled from billets is away from 2.15c., base, mill, but at the moment demand is hardly strong enough to sustain 2.25c. base, which some makers are quoting.

We quote 25 to 45-lb. sections, rolled from new steel, 2.15c. to 2.25c. base; rolled from old rails, 2c. to 2.10c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Tubular Goods.—The pressure for supplies shows no abatement and it is only by careful scrutiny of orders that steel pipe makers are able to avoid getting sold too far into the year. Speculative inquiry is very active and much such business is being turned down, since present orders for standard pipe are sufficient to engage capacity for the next three months and few mills can now make deliveries on oil well and line pipe short of 60 days. Shortage of lapwelded steel boiler tubes is as

acute as ever; until recently only two makers in the Eastern half of the country were in production. An inquiry for 1000 tons of open-hearth slabs by a local maker of charcoal iron tubes is taken to mean that it has orders for steel tubes. Makers of wrought iron pipe and iron boiler tubes are well sold up for the present quarter. The supply situation generally is so tight that prices are easily maintained. Discounts are given on page 513.

Hot-Rolled Flats.—Most makers have so much business booked that they no longer are interested in orders except at an advance of $3 per ton over recent prices. Practically all makers now are quoting material of ordinary gages and widths at 2.90c., base, Pittsburgh, and 2.75c. may be said to have disappeared except as a basis on shipments against old orders. On light gage stock, 1-in. and narrower, as high as 3.50c., Pittsburgh, is being named by some makers. This material is quotable from 3c. to 3.50c., as there are one or two makers still taking business at 3c. to 3.10c., base. Non-integrated manufacturers are not eager for second quarter business even at 2.90c., since indications point to higher billet prices for that period. Prices are given on page 513.

Cold-Rolled Strips.—Leading producers have generally advanced prices $5 per ton since a week ago and the market now is at 4.75c. base, Pittsburgh, for either prompt or second quarter business. Makers in this district are sold well into the second quarter, generally at 4.50c., base, and the advance just announced probably is based on a desire to avoid further commitments at 4.50c. in the event an expected advance in hot-rolled material materializes. Some producers are quoting 5c., base, Pittsburgh, but the demand, though good, hardly is strong enough yet to sustain that price except on retail lots wanted in a great hurry.

Sheets.—The leading interest is likely to have little, if any, tonnage over and above the requirements of its regular customers during the second quarter and this situation means that advances by independent mills are certain. Already a number of independents are out of the market for this quarter and those still open for orders are demanding and obtaining $3 to $5 per ton above the Steel Corporation bases. For reasonably early delivery, 3.50c., base, now is minimum on black sheets, while it takes a desirable piece of business to bring a quotation of 4.50c., base, on galvanized. Blue annealed sheets are hard to find at less than 2.65c. for early delivery. Mill operations are holding up well and the industry as a whole remains well above 90 per cent of capacity. Prices are given on page 513.

Tin Plate.—Operations of the leading interest still are somewhat hampered by a shortage of steel, this being particularly true in the Middle West, where the American works, Elwood, Ind., still is down. There is some talk that the Columbus works, Carnegie Steel Co., will soon reopen; this is a little doubtful, since that is a high cost plant, but its resumption would mean a better supply of steel for Ohio and Middle Western units. Independent mills are running well, but there are fears of a shortage before summer and in this connection is a fresh effort by independent makers to advance prices. This cannot be very well done during this half of the year, since important consumers are covered for that period, but it is a possibility for third and fourth quarters. There is no basis as yet for a higher quotation than $4.75 per base box, Pittsburgh for standard cokes.

Cold-Finished Steel Bars and Shafting.—Specifications against first quarter contracts, generally carrying a price of 2.50c., base, Pittsburgh, are liberal and there is also a very fair demand at the new base of 2.65c. There is a disposition on the part of some makers to avoid contracts and to confine bookings to orders with specifications. We note one sale of 1500 tons at the new price. With hot-rolled bars getting stronger, an early advance to 2.75c. for cold-finished bars is looked for in some quarters. Ground shafting holds firm at 3.05c., base, f. o. b. mills for carload lots.

Bolts, Nuts and Rivets.—Makers in this district report a good business, although there are more specifications than brand new orders. Prices are strengthening with the steel market, but it is not yet claimed that the market is back to published quotations. Prices and discounts are given on page 513.

Track Fastenings.—Recent price advances are helping specifications against contracts and do not appear to be affecting new demands. Prices are unchanged except that on 5/16 x 2½-in. railroad spikes, some makers now are quoting $3.75 base per 100 lb. in carlots. Prices are given on page 513.

Coke and Coal.—Furnace coke has eased off 50c. per ton further since a week ago, it now being quotable at $7 to $7.25 per net ton, ovens, for spot tonnages. The lower figure was paid on a contract for 500 tons a day for the second quarter, by a Youngstown steel maker, and it is believed that other contracts for this period will command about the same price, due to the fact that there are so many blast furnaces in or going in which are dependent on the Connellsville district for either coke or coal. Available supplies for prompt delivery have been reduced by car shortages and sickness among the miners and oven workmen. The decline in furnace grade has not yet affected the price of standard 72-hr. fuel, which is still quotable from $8.50 to $9 per net ton at oven. The coal market is extremely dull and with supplies quite ample for wants, prices are easy. We quote mine run steam coal from $2.50 to $3 per net ton at mines; coking coal at $3.25 and gas grade at $3.50.

Old Material.—Offerings are very scant, due to the fact that very little material can come in this direction with other markets netting better prices. Prices, however, do not fully reflect the supply situation because important melters here remain out of the market. The best bid that might possibly be made by local steel companies on heavy melting steel scrap would be $23, while $22 is the idea of one large consuming interest. Meanwhile, as high as $25 is said to have been paid in Youngstown, though it is not clear whether this was by dealers or melters. Pennsylvania Railroad offerings went close to $24 for heavy melting grade and above $26 for the specialties. These prices were paid by dealers and in a broad way, the strength of the market here is due more to the activity of the dealers than of consumers. Prices on a number of steel works grades, notably heavy melting steel, are nominal in the absence of business. The Norfolk & Western received bids this week on 4600 tons of iron and steel scrap.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$23.00 to $23.50
No. 1 cast, cupola size	25.00 to 25.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa.	23.00 to 24.00
Compressed sheet steel	21.50 to 22.00
Bundled sheet sides and ends	20.00 to 20.50
Railroad knuckles and couplers	25.00 to 25.50
Railroad coil and leaf springs	25.00 to 25.50
Low phosphorus standard bloom and billet ends	27.50 to 28.00
Low phosphorus, plates and other grades	26.50 to 27.00
Railroad malleable	23.00 to 24.00
Locomotive axles, steel	27.00 to 28.00
Steel car axles	25.00 to 25.50
Cast iron wheels	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
Machine shop turnings	18.50 to 19.00
Heavy steel axle turnings	19.50 to 20.00
Short shoveling turnings	18.50 to 19.00
Cast iron borings	19.50 to 20.00
Heavy breakable cast	22.00 to 22.50
Stove plate	17.50 to 18.00
Sheet bar crop ends	25.00 to 25.50
No. 1 railroad wrought	21.00 to 22.00

Atlas Steel Research Division

The Atlas Steel Corporation, Dunkirk, N. Y., announces the establishment of a research division of its metallurgical department. The research division is to be under the direction of Edgar C. Bain, who has been research metallurgist at the Cleveland wire division of the General Electric Co., and retains contact with it in a consulting capacity. Mr. Bain has done much pioneer work in the X-ray spectrographic study of the crystal structure of metals, and is the author of a number of papers on that subject. He will continue this work.

Chicago

Premiums Paid for Quick Delivery—Prices of Finished Products Advancing

CHICAGO, Feb. 13.—The shortage of steel available for early delivery is becoming so acute that premium prices for emergency service are being paid rather commonly. Serious complications are arising among an increasing number of manufacturing consumers because of their inability to obtain material to sustain their production programs. Heavy drafts are being made on jobbers' stocks in order to get quick delivery. Even some of the largest users, like the leading maker of low priced cars and other automobile interests, are buying warehouse material in order to maintain their manufacturing schedules. Incidentally the willingness of the automobile industry to pay high prices for prompt material recalls the similar role it played in the 1920 market. The pressure for steel for quick shipment has been felt not only by the warehouses but by the mills. As high as $15 a ton premium has been offered for sheets and small tonnages of plates for spot shipment are reported to have moved at all the way from 2.75c. to 3.25c., Pittsburgh.

Orders and specifications received by local mills continue in excess of production, although considerable business is being turned away because deliveries desired by buyers cannot be met. The pronounced strength of the market has been reflected in general advances. For indefinite delivery, soft steel bars are now quoted at a minimum of 2.25c., Chicago, mill, while the bottom on plates and shapes is 2.35c., Chicago. The second quarter prices of the leading local independent, about to be announced, will probably be higher on those products. A number of mills east of here are quoting 2.25c., Pittsburgh, or more, on plates, shapes and bars. Bar iron has advanced to a minimum of 2.50c., Chicago mill, while rail steel bars are up to 2.10c., mill. Plain bright wire has advanced to $2.65, Pittsburgh, and wire nails are quoted at a minimum of $2.80.

The continued weakness of coking coal in the Pittsburgh districts is being closely watched because of its possible effect on coke and pig iron. Inadequate transportation is still impeding the delivery of fuel with the consequence that local mills and blast furnaces are unable to increase their operations. The situation is believed to be traceable largely to a shortage of motive power and a steady increase in the number of serviceable locomotives on the rails is expected to make itself felt as spring approaches. Numerous private shops which never did locomotive work before are engaged in engine repairs and new locomotives on order are being completed and put into service. These and other factors are expected to result in an easier fuel situation, but the scarcity of labor on the other hand, will probably grow more acute. As between the opposing tendencies of fuel and labor, the net effect on costs is problematical.

The Illinois Steel Co. continues to operate at 83 per cent of ingot capacity, while the Inland Steel Co. is on a 75 to 80 per cent basis.

Pig Iron.—Caution still characterizes the attitude of melters and while there is a steady, though gradual, increase in second quarter orders, nothing resembling a real buying movement has yet developed. At the same time, producers are not pushing sales because of the uncertainty of future costs. The scarcity of fuel is still pronounced and present stocks of ore will soon be exhausted, whereupon new supplies will have to be bought from the mines. Outside of a comparatively small tonnage of malleable in brokers' hands, which can still be purchased at $29, base, the market has been firm at a minimum of $29.50, local furnace, and an advance announced today of 50c. a ton brings the base price up to $30 furnace. Southern foundry shipped by water and rail is still available at $28.50, delivered, while all-rail material is quoted at $25, base, Birmingham. Current inquiries for second quarter shipment include 1000 tons of foundry for a local melter, a like tonnage for a northern Illinois user, besides a number of smaller tonnages. There is also a fair demand for prompt material.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of [illegible] per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.15
Northern coke, No. 1, sil. 2.25 to 2.75	$30.00 to 30.50
Northern coke, foundry No. 2, sil. 1.75 to 2.25	29.50 to 30.00
Malleable, not over 2.25 sil.	29.50 to 30.00
Basic	29.50 to 30.00
High phosphorus	29.50 to 30.00
Southern No. 2, first quarter	31.01
Southern No. 2, second quarter	28.50 to 31.01
Low phos., sil. 1 to 2 per cent, copper free	37.00
Silvery, sil. 8 per cent	41.29

Ferroalloys.—Some sellers of ferromanganese are now quoting $110, seaboard, but this price is not yet general. Owing to a reduction of the freight to $8.58 from furnace, the delivered price on spiegeleisen is lower.

We quote 80 per cent ferromonganese, $115.08, delivered; 50 per cent ferrosilicon, $85 to $87.50, delivered; spiegeleisen, 18 to 22 per cent, $41.58, delivered.

Billets.—Open-hearth rolling billets range from $42 to $43, Chicago mill. We note a recent sale of 5000 tons at $42.

Plates.—The minimum going price for material for shipment at mill convenience is now 2.35c., Chicago, while steel for specific delivery is moving at higher quotations. Heavy premiums, in fact, have been paid for quick shipment. Oil storage tank business is again a feature of the market, inquiries calling for a total of 18,000 tons. A local mill has booked a like tonnage to cover tank awards recently placed with fabricators. New car inquiries are few, but local mills still have protections out on 18,000 freight cars and 266 passenger cars.

The mill quotation is 2.35, Chicago. Jobbers quote 3.05c. for plates out of stock.

Bars.—Mild steel bars, bar iron and rail steel bars have all advanced. For delivery at mill's convenience, soft steel bars are now at minimum of 2.25c., Chicago. A number of mills east of here are quoting 2.25c., Pittsburgh. Bar iron is firm at 2.50c., Chicago mill, while rail carbon bars have advanced to 2.10c., mill.

Mill prices are: Mild steel bars, 2.25c., Chicago; common bar iron, 2.50c. to 2.60c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 2.95c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.65c. to 2.75c. base; hoops, 4.30c.; bands, 3.75c.

Sheets.—The pressure for prompt material is increasing and the leading maker of cheap automobiles is offering as much as $15 a ton premium for quick mill shipments besides drawing upon available warehouse stocks. The local independent has not yet announced its second quarter prices. Its output for that period will be allocated among customers.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.75c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Bolts and Nuts.—Advances in prices are one step nearer as the result of the rise in raw material. Liberal specifications are being received from the automobile industry and farm implement makers, particularly manufacturers of tillage tools.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ⅞ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off.

Wire Products.—The leading interest has advanced bright plain wire to $2.65 per 100 lb., wire nails to $2.80 per keg, and wire rods to $49.50, base Pittsburgh. A

number of independents have advanced to $2.75 on wire and $3 on nails, so that there is again a double standard of prices for these commodities. The leading producer is booked two to three months ahead and is allocating its output. Demand is heavy.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.45; No. 9 and heavier bright basic wire, $3.30 per 100 lb.; common wire nails, 3.45 per 100 lb.; cement coated nails, $2.60 per keg.

Cast-Iron Pipe.—With demand insistent, prices are strong at $45 to $46, Birmingham, for 6-in. and over. Detroit has awarded 5360 tons of 6-, 8 and 12-in. to the Lynchburg Foundry Co. The United States Cast Iron Pipe & Foundry Co. has taken 3500 tons of 42-in. for St. Paul, while the American Cast Iron Pipe Co. is low bidder on 1500 tons of 6- to 12-in. for Minneapolis. The National Cast Iron Pipe Co. was the successful bidder on 685 tons for Kenosha and 300 tons for Fond du Lac, Wis. Pending business includes: St. Henry, Ohio, 200 tons of 4-, 6- and 8-in., bids to be in Feb. 13; Nokomis, Ill., 110 tons of the same size, Feb. 14; Wheaton, Ill., 167 tons of 4- and 6-in., Feb. 12; Marengo, Ill., 100 tons of 4- and 6-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $57.20 to $58.20; 6-in. and above, $53.20 to $54.20; class A and gas pipe, $3 extra.

Rails and Track Supplies.—Iron tie plates have generally advanced to 2.60c., mill.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 3.85c. to 4c., mill; iron tie plates, 2.60c.; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.65c. base and track bolts, 4.65c. base.

Structural Material.—Bids have been asked on a local power station for the Commonwealth Edison Co. involving 10,000 tons and a shop addition for the People's Gas Co., Chicago, requiring 2000 tons. An open-hearth addition and a new mill for the Inland Steel Co. will take a total of fully 7000 tons. In the face of unremitting building activity, a pronounced scarcity of plain material is developing. The minimum price on material for indefinite mill shipment is 2.35c., Chicago, while higher prices are being paid for specific delivery. Consumers are drawing heavily on warehouse stocks and this is particularly true of the smaller shapes ranging from bar sizes up to five or six in.

The mill quotation on plain material is 2.35c., Chicago. Jobbers quote 3.05c. for plain material out of warehouse.

Reinforcing Bars.—New lettings are few, but a lull was to be expected after the heavy business closed just prior to the recent advances. With local mills allocating their tonnage and warehouse stocks depleted, the available supply of concrete bars is restricted, and competition for new business is not so keen as some weeks ago. Most sellers are quoting 2.75c. local warehouse, although the 2.65c. price has not entirely disappeared. Lettings include:

Hotel, Sixty-fourth Street and Cottage Grove Avenue, Chicago, 250 tons to Kalman Steel Co.

Corn Products Refining Co., Plant, Argo, Ill., 200 tons to Truscon Steel Co.

School, Holland, Mich., 110 tons to Kalman Steel Co.

Pending business includes:

Commonwealth Edison Co., Crawford Street power station, Chicago, 650 tons.

Carpenter Building, Milwaukee, 370 tons, revised bids taken.

Monroe Drug Co. building, Quincy, Ill., 200 tons.

Allied Packers, Inc. plant, Chicago, 175 tons.

Cannon Hotel, Danville, Ill., 100 tons.

Coke.—Demand is exceedingly heavy; in fact, local producers are receiving inquiries from sections which they never attempted to serve. Owing to inability to obtain coal requirements, however, they find it difficult even to take care of their own customers. Local by-product foundry remains unchanged at $15, delivered Chicago switching district, and $15.75 Milwaukee. Coke from outside sources is difficult to obtain, although it is declining in price. Standard Connellsville foundry is quoted at $8.50, ovens, or $12.66, delivered Chicago, while Southern by-product foundry, taking a rate of $4.30, is offered at $12.55, delivered.

Old Material.—The market is strong and prices continue to tend upward. Consumer purchases of cast and malleable grades have been particularly liberal, while orders from the iron mills have been fair. No further purchases of heavy melting are reported outside of about 3000 tons bought by one of the smaller interests. An interesting development lies in the fact that heavy melting can now be shipped from this market to Youngstown and Pittsburgh where buyers are now paying $25 a gross ton. The freight to Youngstown is $5.04 and to Pittsburgh $5.42, leaving $19.96 and $19.58 net respectively to Chicago shippers. The best possible net price to sellers to Chicago mills is $19.45, the lowest switching rate here being 55c. a ton. Available supply of scrap is still low and new railroad offerings are not heavy. The Wabash has advertised 3000 tons, the Chicago & Alton 750 tons and the Soo Line 500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$23.50 to $24.00
Cast iron car wheels	27.00 to 27.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	26.00 to 26.50
Rails for rolling	21.50 to 22.00
Steel rails, less than 3 ft.	24.00 to 24.50
Heavy melting steel	19.75 to 20.00
Frogs, switches and guards cut apart	19.75 to 20.00
Shoveling steel	19.50 to 19.75
Drop forge flashings	16.00 to 16.50
Hydraulic compressed sheets	17.00 to 17.50
Axle turnings	17.50 to 18.00
Per Net Ton	
Iron angles and splice bars	24.00 to 24.50
Steel angle bars	20.00 to 20.50
Iron arch bars and transoms	24.00 to 24.50
Iron car axles	27.00 to 27.50
Steel car axles	21.50 to 22.00
No. 1 busheling	16.25 to 16.75
No. 2 busheling	12.00 to 12.50
Cut forge	17.50 to 18.00
Pipe and flues	14.50 to 15.00
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.50 to 18.00
Steel knuckles and couplers	23.25 to 23.75
Coil springs	24.25 to 24.75
No. 1 machinery cast	23.00 to 23.50
No. 1 railroad cast	22.50 to 23.00
No. 1 agricultural cast	22.00 to 22.50
Low phos. punchings	20.00 to 20.50
Locomotive tires, smooth	20.50 to 21.00
Machine shop turnings	13.00 to 13.50
Cast borings	14.75 to 15.25
Short shoveling turnings	14.75 to 15.25
Stove plate	20.00 to 20.50
Grate bars	19.50 to 20.00
Brake shoes	20.00 to 20.50
Railroad malleable	23.50 to 24.00
Agricultural malleable	23.50 to 24.00

Detroit Scrap Market

DETROIT, Feb. 13.—While the market has every note of firmness and there is a heavy demand on all grades of scrap material, prices have not recorded any substantial advance over those reported a week ago.

The following prices are on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$18.00 to $19.00
Shoveling steel	18.00 to 19.00
No. 1 machinery cast	24.00 to 26.00
Cast borings	15.00 to 16.00
Automobile cast scrap	27.00 to 29.00
Stove plate	18.00 to 19.00
Hydraulic compressed	17.00 to 18.00
Turnings	14.00 to 15.00

The American Sheet & Tin Plate Co. will spend $150,000 this year for improvements at its Chester, W. Va., works. This plant is one of two plants of the company devoted exclusively to specialty work in black plate. The other is at Cambridge, Ohio. All records for production at the Chester plant were broken last month and indications are that February will be another banner month.

New York

Pig Iron Situation Strong with Active Buying by Important Companies

NEW YORK, Feb. 13.—The pig iron situation is very strong. This is due partly to the fact that melters are finding that their melt is larger than they expected and also to slow deliveries that are being made by steel companies which some time ago sold foundry iron freely. The largest tonnage of the week was placed by the Singer Mfg. Co. for 5000 tons, silicon 3 to 3.50 per cent, and this transaction is regarded as of unusual significance because the company has a blast furnace. The Worthington Pump & Machinery Corporation has purchased about 3000 tons for first half, of which about 1500 tons will go to the plant at Harrison and the remainder to plants at Holyoke, Buffalo and Cudahy, Wis. The company is expected to buy 750 tons for its plant at Elmwood, Ohio, this week. It is understood that 2000 tons of the purchase was of Virginia iron. The Worthington company, about three weeks ago, bought a tonnage which it estimated would suit its requirements to July 1, but soon found the additional purchase necessary. A heating company is expected to buy from 2000 to 3000 tons for second quarter this week and a number of other companies are in the market for tonnages ranging from a few carload lots to 1000 tons. Owing to suspension of shipments from France and unsettled conditions in the occupied German territory, it is not expected there will be any further importations of Continental iron for some time, or that England or Scotland will be a factor of any importance in the market.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$32.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	31.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	30.27
Buffalo, sil. 1.75 to 2.25	31.91
No. 2X Virginia, sil. 2.25 to 2.75	33.44
No. 2 Virginia, sil. 1.75 to 2.25	32.44

Ferroalloys.—Demand for ferromanganese continues moderate and confined generally to small lots. Sales in the past week have aggregated 1500 to 2000 tons of British alloy at the established quotation of $107.50. Demand for spiegeleisen is also moderate with sales confined to small lots at prevailing quotations. Consumers of 50 per cent ferrosilicon are well covered by contract and those needing the alloy can obtain it at a range of $82.50 to $87.50., delivered, depending on the quantity and other conditions. There is no activity in ferrochromium which continues at 12c. to 14c., per lb. of contained chromium, delivered.

Cast-Iron Pipe.—The market continues active and prices firm. Demand from private sources is plentiful and there are a fair number of municipal tenders. The 2500 tons of 30-in. water pipe, for the City of Woonsocket, R. I., bids on which were opened Feb. 7, was awarded to the United States Cast Iron Pipe & Foundry Co. On Feb. 13 bids were opened by the City of Boston on about 1450 tons of 60-in. water pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $56.50; 4-in. and 5-in., $61; 3-in., $66.80, with $4 additional for Class A and gas pipe. The soil pipe market continues active with buying by jobbers fairly heavy. The meeting this week of the Eastern Supply Association, which generally results in a brief quietness in buying by jobbers, has evidently not had any effect on orders this year. The transportation situation, particularly in the New England district, is still a serious obstacle and is now further complicated by the bad weather. We quote discounts of both Southern and Northern makers, delivered New York, as follows: 2 to 6-in. standard, 18 to 20¾ per cent off list; heavy, 28 to 30¾ per cent off list.

Warehouse Business.—Business continues good and no changes in prices are reported. The sheet market is reported to be stiffening slightly, but sales are still being made at 4.35c. to 4.50c. per lb. base on black and 5.25c. to 5.50c. per lb. base on galvanized sheets. Business is active in the brass and copper market and prices firm since the recent advance on most products. The recent reduction of discounts on both wrought iron and steel pipe has evidently not affected demand, which continues fairly heavy on steel pipe, particularly on the smaller sizes. We quote prices on page 528.

High-Speed Steel.—The market is unchanged. Producers continue to quote 18 per cent tungsten high-speed steel at 75c. to 80c. per lb. with special brands of some companies ranging up to 90c. per lb.

Finished Iron and Steel.—Prices of plates, shapes and bars have moved up another notch since a week ago. The minimum on all three products is now 2.20c., Pittsburgh, and within a day or two even this figure may disappear. Several of the makers are quoting not less than 2.25c., Pittsburgh, while on structural shapes two Eastern mills are asking 2.35c., Pittsburgh, for prompt shipment material. Some of the largest producers have instructed their sales offices to make no quotations without first submitting the inquiry to the general sales office for consideration. The mills are choosing their orders with a discrimination not shown since 1920. The demand for structural steel continues strong and it is for building construction that some of the largest tonnages are being asked.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, plates and structural shapes, 2.44c. to 2.59c.; bar iron, 2.44c. to 2.49c.

Coal and Coke.—The coal and coke situation is easier and Connellsville coke can be had as low as $8.75, ovens, although from $9 to $9.50 is usually quoted. Furnace coke is quoted at $7.50 to $8.

Old Material.—Active demand continues from eastern and western Pennsylvania mills, and in addition there have been a number of inquiries recently by exporters for shipments of either No. 1 heavy melting steel or railroad quality to Japan, Cuba and Great Britain. Quotations received, however, were evidently too high, as no contracts for export are reported. The market is strong and No. 1 heavy melting steel is quotable at $16.50 to $17 per ton with railroad quality at $17 to $17.50 per ton. While as high as $24.50 delivered to Vandergrift, Pa., has been paid, this was on a tonnage of strictly structural material. For shipment to Claymont, Del., $20.25 per ton has been paid for No. 1 steel and for Midland and Monessen, as high as $22.25. About $18.50 per ton is being paid for shipment of pipe to Lebanon and to Duncannon, Pa. There is somewhat of a range in prices paid for stove plate in this district because of the divergence of prices paid by nearby foundries and those with a high freight rate. As high as $20 per ton has been paid for Mahwah, N. J., but for shipment to Harrisburg about $18 is the price on stove plate. For heavy breakable cast, $22 per ton delivered Harrisburg has been paid and on cast-iron wheels $24.50 delivered Berwick, figures back to a price New York of $19.50 to $20 per ton. Mixed borings and turnings and clean cast borings are generally unchanged, the price delivered Bethlehem still being $17.50.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$16.50 to $17.00
Steel rails, short lengths, or equivalent	17.00 to 17.50
Rails for rolling	18.00 to 18.50
Relaying rails, nominal	26.00 to 27.00
Steel car axles	20.00 to 21.00
Iron car axles	26.00 to 27.00
No. 1 railroad wrought	18.50 to 19.00
Wrought iron track	17.00 to 17.50
Forge fire	13.00 to 14.00
No. 1 yard wrought, long	17.50 to 18.00
Cast borings (clean)	14.25 to 14.75
Machine-shop turnings	14.25 to 14.75
Mixed borings and turnings	14.25 to 14.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	14.25 to 14.75
Stove plate	15.50 to 16.50
Locomotive grate bars	16.00 to 16.50
Malleable cast (railroad)	16.00 to 16.50
Cast-iron car wheels	19.50 to 20.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$22.00 to $23.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	19.00 to 20.00
No. 1 heavy cast, not cupola size	17.00 to 18.00
No. 2 cast (radiators, cast boilers, etc.)	17.50 to 18.50

Boston

Buying Less Active with Some Irregularity Shown in Quotations

BOSTON, Feb. 13.—A Buffalo furnace heretofore quoting silicon 1.75 to 2.25 at $27.50 and No. 2 X at $28, has advanced 50c. Another was on a $28 and $29 basis, but is now $28 and $28.50. An eastern Pennsylvania furnace has offered to sell at $28 base. No other price developments are noted in a less active domestic iron market. Prompt shipment buying features sales, with Buffalo leading in tonnage. Fewer bookings of foreign iron suggest some easing in the transportation situation, which is still bad, however. A Vermont foundry inquiring for 500 to 1000 tons bought 500 tons Continental at $28.75 c.i.f. Boston, duty paid, the largest foreign iron sale reported. More business in Scotch, silicon 2.50 plus, at $30 on dock Bridgeport, Conn., duty paid, is reported. Foreign irons, therefore, are no higher notwithstanding tighter European markets. Among second quarter inquiries, 2000 tons, silicon 2.50 plus, from a central Massachusetts foundry, and 800 tons No. 2 X and No. 1 X from the Westinghouse, Springfield, Mass., interests, are the largest.

We quote delivered prices on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

Eastern Penn., sil. 2.25 to 2.75	$32.15 to $33.65
Eastern Penn., sil. 1.75 to 2.25	31.65 to 32.65
Buffalo, sil. 2.25 to 2.75	33.41 to 33.91
Buffalo, sil. 1.75 to 2.25	32.91
Virginia, sil. 2.25 to 2.75	33.42 to 34.42
Virginia, sil. 1.75 to 2.25	32.92 to 33.92
Alabama, sil. 2.25 to 2.75	34.10 to 35.10
Alabama, sil. 1.75 to 2.25	33.60 to 34.60

Iron Importations.—A total of 1,984 tons of foreign iron arrived at this port during the week ending Feb. 10. Of this amount, 1730 tons were English and 254 tons Continental iron. Importations (corrected) for the previous week were: 1200 tons of Scotch, 558 tons of Continental, 645 tons of English, and 1194 tons of Belgium, a total of 3597 tons. Importations for February to date are 4381 tons, contrasted with 11,915 tons for the corresponding period in January.

Finished Material.—Bars sold in this territory the past week at 2.25c. Pittsburgh. Consumers this week bid 2.30c. for round tonnages. Structural steel bookings are mostly for small tonnages. A street railway company wants 500 tons T rails. Another bought $140,000 of track material, splitting the business four ways. Alloy steels are more active than at any previous period this year.

Warehouse Business.—Business is slowly expanding, with iron and steel prices firm on the recently upward revised basis. Barbed wire is higher, common galvanized two-ply now being $3.55 per 100 lb. in carlots. Cut nails are 15c. a keg higher and poultry netting staples 35c. per 100 lb.

Jobbers quote: Soft steel bars, $3.21½ per 100 lb. base; flats, $4; concrete bars, $3.36½; structural steel, $3.21½ to $3.65; tire steel, $4.65 to $5; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.40; hoop steel, $4.90; cold rolled steel, $4.15 to $4.65; refined iron, $3.21½; best refined, $4.50; Wayne iron, $5.50; Norway iron, $6.60 to $7.10; plates, $3.31½ to $3.53½; No. 10 blue annealed sheets, $4.21½ per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Coke.—The supply situation is no better. Both New England makers of by-product foundry coke are far behind on deliveries, while shipments of Connellsville fuel into New England is uncertain. New England by-product coke remains unchanged at $15 to $16 delivered within the $3.10 freight rate zone.

Old Material.—The market is less active because of the inability of shippers to secure cars. The Boston & Maine Railroad is still embargoed on points east of Harrisburg, Pa., and against the New Haven Railroad. Shippers report trouble in getting the New Haven to accept Boston & Maine cars for eastern Pennsylvania delivery. Dealers are not anxious to take on additional business until the transportation situation is clearer. Heavy melting steel is 50c. higher at $17 to $17.25, with $17.50 offered here and there. Chemical cast iron borings are up $1 at $18 to $19, while $20 is bid on 400 tons for nearby delivery and $20.50 asked. At $17 on cars, horseshoes are up 50c. Pipe continues in demand at $14.10 shipping point, and steel turnings at $13. Cotton ties sold the past week at $13 on cars. Machinery cast is inactive once more. New England foundries are melting comparatively little cast.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$23.50 to $24.00
No. 2 machinery cast	21.50 to 22.00
Stove plate	16.50 to 17.00
Railroad malleable	22.00 to 23.00
Bundled sheets	14.00 to 14.50
Car wheels	20.00 to 21.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$17.00 to $17.25
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
Wrought pipe (1 in. in diam., over 2 ft. long)	13.60 to 14.10
Machine shop turnings, regular	12.50 to 13.50
Cast iron borings, rolling mill	13.50 to 14.00
Cast iron borings, chemical	18.00 to 19.00
Blast furnace borings and turnings	12.00 to 12.50
Forged scrap and bundled skeleton	14.00 to 14.25
Axles	20.00 to 20.50
Shafting	20.00 to 21.00
Rails for rolling	17.00 to 17.50

Birmingham

Active Selling with $25 Now Quoted by All Birmingham Furnaces

BIRMINGHAM, Feb. 13.—Although one Tennessee furnace is still said to be quoting on a basis of $24, Birmingham iron is not quoted at less than $25. The Standard Sanitary Mfg. Co., which bought 11,000 tons of Southern iron from four companies a few days ago, is understood to have paid $24.50 for 3000 tons and $25 for 4000 tons; also that another company took 2000 tons at $24, but is now quoting $25. The Tennessee furnace which is quoting $24 has a $1 differential to competitive markets north of Ohio and Birmingham. No iron can be had in Birmingham under $25. One maker sold 10,000 tons into third quarter, the only iron of that kind heard from. He says the price was $25. One maker operating one stack at present booked 25,000 tons in January and a like amount this month. His yards are bare and delayed operation of a new stack makes him currently oversold. Another maker booked 10,000 tons last week, some in the East and all at $25. January iron producing record was the largest since December, 1917. Increase in production will be difficult from now on. Stocks on yards were reduced 22,000 tons in January, and present rate of outgo presages bare yards at end of the month. Stocks on hand Jan. 1 and Feb. 1 were as follows: Foundry, 53,000 and 41,000; machine cast, 6800 and 2100; basic, 14,000 and 10,000; totals, 75,000 and 53,000.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry silicon 1.75 to 2.25	$25.00
Basic	24.00
Charcoal, warm blast	33.00

Cast-iron Pipe.—Pressure pipe continues very active with Birmingham prices as follows: 6 to 12 in., $45; 14 in. and up, $44; 4 in., $49; gas pipe, $48. Sanitary pipe is active at $65 for standard, $70 for fittings and $60 for extra heavy.

Steel Bars.—Steel bars are quoted 2.40c. f.o.b. Birmingham mill and demand is active.

Coal and Coke.—Coke sells readily to extent of production at $8 and $8.50 for spot. Most consumers are asking for maximum quotas under contracts.

Old Material.—The scrap market is very lively in all kinds of cast scrap, but large steel users are out of market for the present. Prices are unchanged. We quote per gross ton f.o.b. Birmingham district yards as follows:

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$16.00 to $17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

Cincinnati

Round Tonnage of Pig Iron Sold to a Kentucky Sanitary Company

CINCINNATI, Feb. 12.—A sale of 11,000 tons of Southern iron to a Kentucky sanitary ware manufacturer is the market feature. This iron is for second quarter shipment and prices are reported to range from $24 to $25, base. The order is reported to have been divided between four furnaces. On the whole, the market is showing fair activity and a number of sales are reported, ranging from carload lots to 800 tons. A number of small sales of Southern iron have been made on the basis of $24, Birmingham, but while this price can still be done, the market is more nearly $25 than $24. Some furnaces are now quoting on third quarter inquiries, naming $25 as the price, or the same figure as for second quarter. In the North, $28 is now the minimum, all Ironton district furnaces having advanced to $28 last week and all reporting booking orders at that figure. More inquiries are coming out. A local melter is in the market for 2000 tons of foundry iron, a Michigan melter for 2000 tons of malleable, a central Ohio implement manufacturer for 700 tons of malleable, and a pump manufacturer for 800 tons of foundry. Charcoal and Bessemer, silveries and basic are in light demand.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$28.55
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	29.05
Ohio silvery, 8 per cent	38.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.27
Basic Northern	29.77
Malleable	30.27

Finished Material.—The demand for finished materials of all kinds continues strong, and manufacturers in need of steel for prompt shipment are now resorting to premium offers in order to secure supply. The mills, however, apparently are sold up so tightly that even attractive premium offerings are finding few takers. Plates are in particularly heavy demand for early shipment, and on some business 2.40c. has been done, with 2.60c. being quoted by one interest. This price, however, was made more as an intimation that the mill was completely out of the market than with a hope of securing an order. The market on bars, shapes and plates generally ranges from 2.15c. to 2.25c., the latter figure being the more generally established on orders carrying six to eight weeks' delivery, and the former price being quoted for delivery at mill's convenience. Sheets are in heavy demand, particularly blue annealed and galvanized, and prices are steadily advancing. Some mills have advanced prices on blue annealed to 3c. and galvanized to 4.75c. and report small sales. On black sheets, 3.60c. is becoming more general. The demand for wire products, though not as heavy as some weeks ago, still is fairly good, and buyers are now asking to be taken care of for their second quarter requirements, and while mills generally have not opened their books for this delivery, some are booking orders subject to prices prevailing at date of shipment. Semi-finished materials are in good demand, and an inquiry for 1000 tons of sheet bars sent out by a mill in this territory did not even result in securing a quotation. Billets are also in good demand, as are wire rods, which are particularly scarce. In the structural field, the activity in this district is confined almost entirely to jobs requiring less than 100 tons each. Some activity is noted in Southern cities, however, and three buildings up for bids will require a total of 3000 tons. Reinforcing bars are very active. The plant of the Central Warehouse & Refrigeration Co., Cincinnati, has been awarded to a local fabricator, and 1800 tons of bars are now being inquired for. A Baptist hospital at Louisville will require about 400 tons, the Donaldson Lithographing Co.'s plant at Cincinnati, 250 tons, a stadium at Wittenberg University, on which bids will be asked about March 10, is expected to require about 1000 tons of shapes and 1000 tons of bars, a freight house for the Southern Railway at Cincinnati, 200 tons, and the projected Temple Bar Office building, Cincinnati, on which bids will be taken soon, will require about 800 tons.

Warehouse Business.—Orders continue good for all finished materials, and prices are very firm. It is expected that an advance in prices of sheets will go into effect this week. Local jobbers in wire products, who report a brisk demand for spring shipment, have advanced prices of plain wire and wire nails $4 and $2 per ton respectively, the new prices being $3.30 per 100 lbs. for No. 9 annealed wire, and $3.30 per keg, base, for common wire nails.

Cincinnati jobbers quote: Iron and steel bars, 3.10c. base; reinforcing bars, 3.20c. base; hoops, lighter than No. 12 4.30c.; bands, 3.85c. base; shapes, 3.20c. base; plates, ¼-in. and heavier 3.10c.; lighter 3.35c.; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.30 per 100 lb.; common wire nails, $3.30 per keg, base.

Coke.—Foundry coke is in good demand, and New River operators are reported to be sold up till April 1. Car shortage is being felt in Wise County and prices are strong. Connellsville coke is softer, standard foundry being quoted at $8.50, and furnace at $7.50. The foundries catering to the automobile trade are the heaviest buyers of foundry coke at present, and are pushing operators for deliveries and also urging them to increase their allotments of the output.

Old Material.—The scrap market is more active in this district, and prices are advancing steadily. A steel works interest is in the market for various grades, and the foundry trade is also buying fair tonnage. Prices are up from 50c. to $2 a ton, and much scrap is being shipped to other districts where higher prices prevail.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$14.50 to $15.00
Iron rails	18.50 to 19.00
Relaying rails, 50 lb. and up	27.50 to 28.50
Rails for rolling	19.50 to 20.00
Heavy melting steel	19.00 to 19.50
Steel rails for melting	17.50 to 18.00
Car wheels	22.00 to 22.50
Per Net Ton	
No. 1 railroad wrought	16.50 to 17.00
Cast borings	14.00 to 14.50
Steel turnings	13.50 to 14.00
Railroad cast	18.50 to 19.00
No. 1 machinery cast	22.00 to 22.50
Burnt scrap	14.00 to 14.50
Iron axles	24.00 to 24.50
Locomotive tires (smooth inside)	17.50 to 18.00
Pipes and flues	14.50 to 15.00

Buffalo

Pig Iron Inquiries Mostly for Small Tonnages —Mills Very Busy

FEB. 13.—While the majority of sellers are quoting $28 base on inquiries for the current period and occasionally on second quarter business, there are unconfirmed reports of $27.50 base with the 50c. differential being quoted by one furnace. The general run of inquiries is for small tonnages, but the aggregate is big. One furnace has under consideration an inquiry for 5000 tons, one for 2000 and the remainder ranging from 500 tons down to carload lots. For No. 2 plain, $28 has been quoted for delivery as far ahead as the first two months of the second quarter but an easier fuel market is responsible for a prevailing opinion among buyers that there will be no increase in price as the year progresses. The small second quarter commitment to date is all for small quantities. Malleable is quoted at $28.50 and basic at $28.

We quote f.o.b. per gross ton Buffalo as follows, the higher price being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$29.00 to $30.00
No. 2X foundry, 2.25 to 2.75 sil.	28.00 to 28.50
No. 2 plain, 1.75 to 2.25 sil.	27.00 to 28.00
Basic	28.00
Malleable	28.50
Lake Superior charcoal	33.28

Finished Iron and Steel.—Mills and sales agencies virtually stand in their same position with reference to their inability to take business; the principal development is that a more careful scrutiny is made before the seller takes on any delivery obligation. Demand for all products is greater and is free from any speculative trend. The local branch of the Steel Corpora-

tion is confining its commitment to only its regular trade and subject to rolling schedules in bars, shapes and plates, but there is a free commitment on light rails. A steel car company is inquiring for 4000 tons of plates and 1000 tons of bars for New York Central work. The Bethlehem Steel Corporation will roll for the fabricators 400 tons of shapes for a department store addition in Buffalo, and 1000 tons of shapes and plates for towers for use in central Ohio. The minimum bar price quoted by two mills is now 2.25c., but some offices are quoting 2.15c. and 2.20c. on such business as can be taken.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.35c.; plates, 3.35c.; soft steel bars, 3.25c.; hoops, 4.35c.; bands, 4.05c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 4.10c.

Coke.—Favorable weather has improved the car situation, and there is prospective weakening in price.

Old Material.—Offers of $25 from Pittsburgh, and $24.50 from Youngstown for heavy melting steel have developed a sharp advance in that product. Dealers are now holding for $23.50 and will have to get that price or will ship to the two other points. The large consumers appear to have booked sufficient tonnage to satisfy requirements for the next three months. Trading between dealers has been in some instances at prices greater than mills are willing to pay. The Erie Railroad list, closed Thursday, brought higher prices than the New York Central. There is a lively demand for all commodities, and an exceptional scarcity in cast scrap.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$23.50
Low phos., 0.04 and under	24.25 to 25.00
No. 1 railroad wrought	20.00 to 20.50
Car wheels	22.00 to 23.00
Machine-shop turnings	15.50 to 16.00
Cast iron borings	17.50 to 18.00
Heavy axle turnings	20.00 to 20.50
Grate bars	19.50 to 20.00
No. 1 busheling	19.25 to 19.75
Stove plate	19.00 to 19.50
Bundled sheet stampings	15.50 to 16.00
No. 1 machinery cast	23.50 to 24.50
Hydraulic compressed	19.50 to 20.00
Railroad malleable	23.00 to 23.50

Cleveland

Heavy Sales of Basic Pig Iron Establish Market at $26 Valley

CLEVELAND, Feb. 13.—Ore is moving off the docks in fair volume, shipments being at about the same rate as in January. An increase in movement is expected as soon as the weather moderates. Consumers have not commenced to take any interest in the market and consequently there are no indications of an early buying movement.

Pig Iron.—Buying for the second quarter has gained momentum and a heavy tonnage for that delivery was booked during the week. Several sales for basic iron aggregating a round tonnage were also made at $26, establishing the Valley market at that price. The United Alloy Steel Corporation, Canton, whose basic inquiry was noted, purchased 15,000 tons for the second quarter. Some producers are now filled with business for the second quarter and one Cleveland maker has virtually withdrawn from the market, now offering only a limited tonnage of iron for prompt shipment. One producer sold 25,000 to 30,000 tons of foundry and malleable iron during the week, mostly for the second quarter and including 6000 tons of malleable to a foundry making automobile castings and several lots of from 1000 to 2000 tons. Another lake furnace has sold 25,000 tons this month, mostly for the second quarter. Sales for that delivery by three producers mostly in the Central Western territory probably exceed 200,000 tons. A few third quarter inquiries have come out, but producers are declining to quote for that delivery. Some of the lake furnace interests have further advanced prices on foundry and malleable grades from 50c. to $1 a ton. One producer during the week sold considerable iron at $28.50 and later advanced its price to a minimum of $29 for the second quarter and to $29.50 to $30 for prompt shipment and has made small lot sales at $30. The Cleveland price has been advanced 50c. to $29. The Detroit price is unchanged at $29. The Singer Mfg. Co., Elizabethport, N. J., purchased 5000 tons of foundry iron. The Worthington Pump & Machinery Corporation is inquiring for 800 tons for Cincinnati delivery. The Westinghouse Electric & Mfg. Co. bought 700 tons for Cleveland delivery, and a Marion, Ohio, consumer is inquiring for 500 tons.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and a $6 rate from Birmingham.

Basic, Valley furnace	$26.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$29.00 to 29.50
Southern fdy., sil. 1.75 to 2.25	30.00 to 31.00
Malleable	29.00 to 29.50
Ohio silvery, 8 per cent	39.52
Standard low phos., Valley furnace	35.00

Sheets.—The market is firmer with 3.50c. apparently the minimum quotation on black sheets and 4.50c. on galvanized. On blue annealed sheets 2.75c. is now the common quotation, although a local mill has advanced these to 3.10c. Mills are not yet taking second quarter contracts, although automobile companies are trying to make reservations of body sheets for that delivery.

Hot and Cold-Rolled Steel.—Hot-rolled strip steel is now generally quoted at 2.90c., an advance of $3 a ton, and hoops in light and narrow gages at 3.50c., an advance of $5. Cold-rolled strip steel has also advanced $5 a ton to 4.75c.

Wire Products.—The American Steel & Wire Co. has advanced prices $2 a ton on wire products, now quoting plain wire at 2.65c. and nails at $2.80 per keg. The Cambria Steel Co. has advanced wire products $4 a ton to 3c. for nails and 2.75c. for wire.

Warehouse Business.—A local jobber has advanced prices $3 a ton on black and galvanized sheets. The same distributor previously announced a similar advance on blue annealed.

Jobbers quote steel bars, 3.06c.; plates and structural shapes, 3.16c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.65c. to 3.76c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and No. 20 gage or heavier, 3.84c.; narrower than 1 in. or lighter than No. 20 gage, 4.36c.

Bolts, Nuts and Rivets.—Bolt and nut specifications are heavy and some consumers are placing additional orders. The market is firm at the September prices. There is a possibility that prices will be advanced to the present published discounts for the second quarter. Rivet specifications are heavy, but new orders are light.

Semi-Finished Material.—The shortage in sheet bars continues active. Some consumers are scouring the market in search of mills that can take their orders. Producers say that they would have no difficulty in getting $40 for sheet bars, could they supply the steel.

Finished Material.—Under continued pressure by consumers steel prices have further advanced and premium prices have become much in evidence for material for early shipment. It is now a question of getting material rather than prices. With orders on their books to keep them running to around the middle of the second quarter, mills are trying to avoid additional commitments and are turning down a great deal of tonnage. Many inquiries are coming out for second quarter contracts, but mills are declining to consider these. On steel bars 2.10c. has about disappeared and these are now generally quoted at a minimum of 2.20c., which is also the bottom price on plates and structural material. For prompt delivery, a local mill has sold steel bars in small lots at 2.75c. to 2.85c., Pittsburgh, and forging bars at 3c. There is evidence that round lots could be sold at 2.50c. for 60 days' delivery. Local mills are quoting plates at 2.50c., Pittsburgh, and are

taking considerable business in small lots at that price. One Eastern mill has sold plates at a price that figures back to 2.75c., Pittsburgh. The Ford Motor Co. has placed 25,000,000 hexagon nuts with a Cleveland manufacturer and is closing contracts with its regular sources of supply for parts for the second quarter. With increased orders, motor truck manufacturers are getting on a large production basis. Some of the automobile companies are inquiring for alloy steel for the second quarter. In the building field a good volume of work continues to come out and some fabricators with delayed deliveries on plain material are not promising delivery of fabricated material in less than six months.

Coke.—Prices on foundry coke are unchanged at $9 to $9.50 for standard Connelsville makes.

Old Material.—Prices have again advanced on all grades from 25c. to $1 or more a ton. Dealers are declining to sell short and are having trouble in covering old orders. Shipments to mills are very slow, this being attributed partly to difficulty in securing labor to work in scrap yards. Buying by mills is limited to small tonnages. Sales are reported at $19 for machine shop turnings and $20 for cast borings for western Pennsylvania delivery. As high as $24 has been offered by dealers for heavy melting steel for Youngstown shipments and it is claimed that for round tonnages, Valley district mills would have to pay $24 to $25. No. 1 cast scrap has advanced $2 per ton.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$21.00 to $21.25
Rails for rolling	23.00 to 24.00
Steel rails under 3 ft	22.00 to 23.00
Iron rails	19.00 to 20.00
Iron car axles	26.00 to 27.00
Low phosphorus melting	23.00 to 24.00
Cast borings	18.50 to 18.75
Machine shop turnings	16.50 to 16.75
Mixed borings and short turnings	17.25 to 17.75
Compressed steel	19.00 to 19.50
Railroad wrought	19.50 to 20.00
Railroad Malleable	20.50 to 20.75
Light bundled sheet stampings	17.00 to 18.00
Steel axle turnings	18.50 to 19.50
No. 1 cast	23.00 to 24.00
No. 1 busheling	17.25 to 17.75
Drop forge flashings over 10 in.	16.50 to 16.75
Drop forge flashings under 10 in.	16.75 to 17.25
Railroad grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Pipes and flues	17.00 to 17.50

St. Louis

Moderate Sales of Pig Iron—Scrap Continues to Advance

ST. LOUIS, Feb. 13.—The principal business of the week was the sale of about 2000 tons of Southern iron to stove plants in Belleville, which have been doing a good business. A northern Illinois melter bought 300 tons of Northern iron and 100 tons of charcoal iron. Most of the sales were of small quantities, but the market was fairly active. The melt is increasing in the district and purchasers are insisting upon prompt shipments against contracts. The market is firm, with Northern iron unchanged at $29 to $30, Chicago, and Southern iron at $25, Birmingham. Inquiries for second quarter shipment were received during the week from melters in Kentucky and Indiana for from 100 to 300 tons, and a northern Illinois melter wants 500 tons of Northern iron.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$31.16 to $32.16
Northern malleable, sil. 1.75 to 2.25	31.16 to 32.16
Basic	31.16 to 32.16
Southern fdy., sil. 1.75 to 2.25	30.17

Finished Iron and Steel.—The largest concerns having sales offices here are virtually out of the market because of heavy bookings. No railroad inquiries of consequence are pending. The Union Pacific bought a carload of charcoal iron 2¼-in. boiler tubes at less than 8 per cent discount. A St. Louis railroad bought a carload of the same product. Fabricators are well booked with business for the present but are looking for business for extended delivery.

For stock out of warehouse we quote: Soft steel bars, 3.05c. per lb.; iron bars, 3.05c.; structural shapes, 3.15c.; tank plates, 3.15c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.05c.; structural rivets, 3.85c. per 100 lb.; boiler rivets, 3.95c.; tank rivets, ⅞ in. and smaller, 55 per cent off list; machine bolts, large, 50 per cent; smaller, 50 per cent; carriage bolts, large, 45 per cent; small, 45 per cent; lag screws, 55 per cent; hot pressed nuts, square or hexagon blank, $2.75; and tapped, $2.75 off list.

Coke.—The market for coke continues active, the coldest weather of the winter during the week adding to the call for domestic grades, which feature the production of the local by-product ovens. There is a good demand for Connellsville and other foundry grades.

Old Material.—The market for old material continues to advance on the strength of some buying by local consumers and scarcity of material. Most material that is shipped goes past St. Louis to Eastern and Ohio Valley markets, which are paying more for it. Very little material is coming from the railroads, the only list of consequence being one from the Union Pacific, 3000 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$21.00 to $21.50
Rails for rolling	21.50 to 22.00
Steel rails, less than 3 ft	22.00 to 22.50
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	27.50 to 28.00
Heavy melting steel	19.50 to 20.00
Heavy shoveling steel	19.00 to 19.50
Frogs, switches and guards cut apart	21.00 to 21.50
Per Net Ton	
Heavy axles and tire turnings	13.50 to 14.00
Steel angle bars	19.50 to 20.00
Iron car axles	28.50 to 29.00
Steel car axles	23.00 to 23.50
Wrought iron bars and transoms	24.00 to 24.50
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.50 to 18.00
Railroad springs	24.50 to 25.00
Steel couplers and knuckles	24.50 to 25.00
Cast iron borings	13.00 to 13.50
No. 1 busheling	16.00 to 16.50
No. 1 railroad cast	21.00 to 21.50
No. 1 machinery cast	22.50 to 23.00
Railroad malleable	20.50 to 21.00
Machine shop turnings	10.50 to 11.00

REFRACTORIES ACTIVE

Makers Heavily Obligated on Clay, Fire and Silica Brick

PITTSBURGH, Feb. 12.—Makers of refractories, particularly those whose business runs heaviest with the iron and steel industry, are heavily obligated and are experiencing much difficulty in keeping abreast of their orders, despite the fact that they entered the year with stocks of considerable proportions. The effect of the big stocks in makers' hands has been to prevent a real shortage, for orders in clay fire brick and silica brick have been at the rate of about 80 to 85 per cent of capacity, while the best operating rate that has been attainable, taking the producing districts as a whole, has been about 65 per cent. Wages have not been attractive enough to enable the manufacturers to secure a full complement of help.

Prices show no special change but the market is stronger in clay fire brick and silica brick to the extent that shading of regular quotations is not as frequent or as severe as it was a few weeks ago. Pennsylvania silica brick are held at $42 per 1000 by the large makers, but the smaller makers, lacking regular consuming connections, still are taking business at $40 and even $38 is said to have been done in the very recent past. There is some irregularity in Missouri clay fire brick, as the advances made by the larger producers are not being observed by all of the other makers. Prices are given on page 512.

Philadelphia

Prices of Plates, Shapes and Bars Move Upward Another Notch

PHILADELPHIA, Feb. 13.—That stage of the steel market has been reached where buyers begin bidding up prices on themselves. The demand for plates, shapes and bars continues strong, and a good deal of it comes from districts which ordinarily look to Pittsburgh, Youngstown and Cleveland mills. Eastern mills, not desirous of supplying consumers who under other circumstances would not buy in this district, have quoted prices which they believed to be prohibitive, only to find that the quotations have been readily accepted, and the orders have sometimes been accompanied by requests for more tonnage at the same figures. In several instances plates have been sold for shipment to Ohio at 2.25c., f.o.b. Eastern mill, and higher.

More and more mills are dropping out of the market on the three major steel products or are quoting only to a very limited extent to regular customers, and the experience of mills which have steel to sell is that they are getting many more inquiries than usual from consumers with whom they seldom do business. On plates, shapes and bars the minimum is now 2.25c., Pittsburgh, for any reasonable delivery, while one large Eastern independent is quoting 2.35c., Pittsburgh, on plates, and a shape mill is quoting 2.35c., Pittsburgh, on that form.

In other departments of the iron and steel market things are quiet, this applying particularly to pig iron and old material.

The labor shortage is becoming more acute, and operators of steel mills and blast furnaces regard this as a factor which must be increasingly reckoned with as spring approaches. The railroad situation is not improving, nor is any easing up looked for until warmer weather shall have melted the snow and ice which now impede traffic in New York State and New England.

Pig Iron.—Sellers of pig iron are not of one opinion as to the future course of the market. At present there is little demand. Only a few inquiries have appeared for second quarter, though the time for such buying would ordinarily be at hand now. There is the prospect of a further decline in coke prices, which usually accompanies the break-up of winter, and a possible improvement in traffic conditions with better weather. There is also the fact that a number of furnaces are ready to be blown in as soon as market conditions justify. These are the arguments used by those who do not expect the pig iron market to maintain its present strength during second quarter. On the other side, it is pointed out that foreign iron, which has been the principal factor in keeping domestic pig iron prices within bounds, will soon practically disappear, as no further shipments are expected from the other side. It is held also that the pig iron market should benefit from the betterment going on in industry generally, and that present prices should at least hold their own if they do not advance. Another important factor is that most of the steel companies, which were active sellers of pig iron during slack times, are now well sold up and are using much more iron in their steel-making processes; hence they will not have much to dispose of over the next several months. It is, in short, a waiting market. The most experienced iron sellers differ as to what may be expected to develop. Meanwhile, consumers in this district are being freely supplied with iron, some on old low-priced contracts. The inability of furnaces to ship to New England customers has made it necessary to ship to points unaffected by embargoes, and therefore there is no shortage of iron anywhere in this district. A tin plate manufacturer is in the market for 4000 tons of basic for shipment within the next few months and a steel plant near Philadelphia is negotiating for basic, which ordinarily it gets from Pittsburgh. In foundry iron, inquiries are confined to small lots, except two for second quarter, one from a Baltimore foundry for 750 tons and the other from a Philadelphia manufacturer for 500 tons. An inquiry is also in the market for 1000 tons of gray forge. Last week's receipts of foreign iron were only 220 tons, all from France, the lowest in several months.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$28.76 to $29.14
East. Pa. No. 2X, 2.25 to 2.75 sil.	29.76 to 30.14
East. Pa. No. 1X	30.76 to 31.14
Virginia No. 2 plain, 1.75 to 2.25 sil.	32.17 to 33.17
Virginia No. 2X, 2.25 to 2.75 sil.	33.17 to 34.17
Basic delivered eastern Pa.	28.00 to 28.50
Gray forge	28.50 to 29.00
Malleable	31.14 to 31.26
Standard low phos. (f.o.b. furnace)	35.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.

Scotch foundry, 2.50 to 3 sil.	$28.75 to $29.25
English foundry, 1.50 to 2 sil.	28.00 to 28.50
English foundry, 2 to 2.50 sil.	28.50 to 29.00
English foundry, 2.50 to 3 sil.	29.00 to 29.50
Continental foundry, 1.80 to 2.50 sil.	28.00
Continental foundry, 2.50 to 3 sil.	28.50
Low phos., copper free, guar. not over 0.035 per cent phos.	28.50 to 29.50

Coke.—Blast furnace coke continues to become easier in price and supply, and market prices now range from $7 to $7.50. Foundry coke is quoted about $1 a ton higher.

Ferroalloys.—Quotations on ferromanganese remain at $107.50, seaboard, for the imported and $107.50, furnace, for domestic. Foreign spiegeleisen has been sold at $39.50, duty paid, Philadelphia, and dealers are holding what they have on hand for the same price, which may shortly be advanced.

Semi-Finished Steel.—Open-hearth rerolling billets are still available at $40, Pittsburgh, but forging billets are higher, $47.50, Pittsburgh, appearing now to be the minimum.

Plates.—So many of the plate mills in the Pittsburgh, Youngstown and Cleveland districts are unable to take business, that an increasing number of inquiries from Ohio is coming to Eastern mills. Prices quoted by the Eastern mills, thought to be too high to take the business, have been readily accepted by the buyers, with requests in some instances for more tonnage at the same price. These prices have averaged about 2.25c., Eastern mill, but some quotations have been higher. On the 10,000 tons inquired for by the Pennsylvania Railroad for second quarter indications are that quotations ranged from 2.25c. to 2.35c., Eastern mill. Eastern plate mills are not operating at capacity and are going slowly in increasing their output, the labor shortage being a restrictive factor of considerable importance. For delivery in the East, mills are quoting from 2.25c. to 2.35c., Pittsburgh, and the former figure now seems to be the minimum for reasonably early shipment.

Structural Shapes.—Quotations on plain material range from 2.25c. to 2.35c., Pittsburgh, with some mills taking little or no business. Steel for the new Packard Building, at Fifteenth and Chestnut Streets, requiring 6000 tons, will be fabricated by the Bethlehem Steel Co. This is the largest local steel fabricating job in some months.

Bars.—Steel bars are becoming harder to get, as most of the mills are well sold up and are declining to quote on many of the inquiries submitted to them. The minimum on bar iron is now 2.15c., Pittsburgh, and a fair volume of business is being booked.

Sheets.—There is increasing strength in prices of sheets. Blue annealed can no longer be obtained at less than 2.75c., Pittsburgh, and 2.85c. is being quoted by one Eastern maker on a majority of inquiries. Black sheets are not less than 3.50c., with a premium being asked in some cases for early delivery, while galvanized sheets appear to be approaching a minimum of 4.75c., Pittsburgh.

Wire Products.—The Cambria Steel Co. has advanced prices of wire products $4 a ton, now quoting wire nails at 3c. per lb. and plain wire at 2.75c. per lb., Pittsburgh.

Warehouse Business.—Orders for steel out of jobbers' stocks are increasing as mills quote longer de-

liveries. Jobbers are having difficulty in maintaining well rounded stocks. Large rounds and hoops and bands, in particular, are hard to get. We quote for Philadelphia delivery out of stock as follows:

Soft steel bars and small shapes, 3.15c.; iron bars (except bands), 3.15c.; round edge iron, 3.35c.; round edge steel, iron finish, 1½ x ½ in., 3.35c.; round edge steep planished, 4c.; tank steel plates, ¼-in. and heavier, 3.25c.; tank steel plates, ⅜-in., 3.47c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3.15c.; structural shapes, 3.25c.; diamond pattern plates, ¼-in., 4.95c.; ⅜-in., 5.15c.; spring steel, 4.25c.; round cold-rolled steel, 4c.; squares and hexagons, cold-rolled steel, 4.50c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.25c.; narrower than 1 in., all gages, 4.75c.; steel bands, No. 12 gage to ⅜-in., inclusive, 3.95c.; rails, 3c.; tool steel, 8.50c.; Norway iron, 6.50c.

Old Material.—Though the scrap market is at present quiet, dealers and brokers look for a renewed demand shortly, and it is their expectation that such demand will force prices higher. There have been few price changes during the week, but these few are advances. A sale of about 2000 tons of rerolling rails has been made at $25, delivered, a sharp rise over prices quoted a week ago. Cast iron car wheels and No. 1 railroad wrought are $1 a ton higher; cast borings for steel works and rolling mills are also up $1, while stove plate is at least 50c. a ton higher. There is little demand for heavy melting steel, which is being sold at $20 to $21, delivered, but indications are that it would be difficult to buy a tonnage even at $21.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$20.00 to $21.00
Scrap rails	20.00 to 21.00
Steel rails for rolling	24.00 to 25.00
No. 1 low phos., heavy 0.04 and under	25.00 to 26.00
Cast iron car wheels	25.00 to 26.00
No. 1 railroad wrought	25.00 to 25.50
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	18.50 to 19.00
Bundled sheets (for steel works)	18.00 to 18.50
No. 1 busheling	19.00 to 20.00
Mixed borings and turnings for blast furnace use	17.50 to 18.00
Machine shop turnings (for steel works use)	18.50 to 19.00
Machine shop turnings (for rolling mill use)	18.50 to 19.50
Heavy axle turnings (or equivalent)	20.00 to 20.50
Cast borings (for steel works and rolling mills)	18.50 to 19.00
Cast borings (for chemical plants)	22.50 to 25.00
No. 1 cast	24.00 to 25.00
Heavy breakable cast (for steel plants)	22.00 to 23.00
Railroad grate bars	19.50 to 20.00
Stove plate (for steel plant use)	19.50 to 20.00
Railroad malleable	19.00 to 19.50
Wrought iron and soft steel pipes and tubes (new specifications)	19.00 to 19.50
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

BASING POINT HEARING

Inland Steel Co. Officials Give Interesting Testimony at Chicago

CHICAGO, Feb. 13.—Lee Block, chairman, and Edward M. Adams, first vice-president and general sales manager, Inland Steel Co., were on the stand today at the hearings in the Pittsburgh basing point case. Mr. Block testified that the advantage of location, meaning the possibility of selling at prices approximately equal to the Pittsburgh base price plus the freight to Chicago, was one of the prime considerations in expanding the Inland plants. It was later brought out in the cross examination that in 1920 the Inland company shipped 107,000 tons out of a total of 621,000 tons of steel produced, to States East of Chicago. Mr. Block explained that part of this tonnage went to Indiana points in the Chicago switching district and it was also pointed out, particularly by Mr. Adams, that most of the tonnage was semi-finished steel. At that time, the Inland company had not completed finishing capacity sufficient to take all the raw steel produced and the surplus had to be disposed of elsewhere. Mr. Adams stated that at the present time not more than 5 per cent of the company's tonnage went to points east of the Chicago switching district while the remainder was distributed approximately as follows: Forty to 50 per cent in the Chicago switching district and Illinois points, 20 per cent in Wisconsin, 15 per cent in Iowa, Nebraska and Kansas, 7.5 per cent in the Northwest, 5 per cent in the Southwest and the remainder scattered.

Under cross examination, Mr. Adams stated that at times steel had been sold to fabricators in the Chicago district for jobs at points east of here and that in such cases the mill had to absorb part of the freight advantage due to location to meet Eastern mill prices. In those instances, the net price to the mill was less than on business in Chicago and the West. Mr. Adams asserted that only a relatively small amount of such tonnage had been booked.

A point which had not yet been developed in the case was brought out for the first time in Mr. Adams' testimony, namely, that price is not the only consideration in seeking business. His company, he stated, adhered to a policy of distributing its sales over a wide range of industries and territories to prevent sudden fluctuations in bookings. Past experience indicated that if the bulk of the company's tonnage were sold to one particular territory or to one branch of industry, a change in business of local scope might be reflected in sudden suspensions or cancellations of orders which would leave the company without any appreciable tonnage on its books. By its policy of sales distribution the company protects itself against fluctuations in demand localized in one territory or one industry; in fact, as a result of this plan, the net prices to the mill are not uniform from all customers owing to the necessity of meeting competition in some sections from mills with lower freight rates to destination.

Mr. Adams asserted that prices are entirely determined by supply and demand. In the course of his testimony, he referred to the latter part of 1921 and early 1922 when demand was exceedingly low and f.o.b. Chicago mill prices on plates, shapes and bars were approximately the same as Pittsburgh mill prices. Yet certain sizes of those commodities are not made at Chicago and the supply being at Pittsburgh they were sold in Chicago territory at the Pittsburgh base price plus the full freight to destination.

(For report of earlier proceedings, see page 479.)

Activities at Youngstown

YOUNGSTOWN, OHIO, Feb. 13.—The Republic Iron & Steel Co. is preparing to blow in its Hannah blast furnace in the Mahoning Valley, idle since 1920.

Iron and steel operations are now at the highest rate in the past two years.

The Tod furnace of the Brier Hill Steel Co. is now being relined and will be started as soon as the work is completed.

The Newton Steel Co. is installing two additional sheet mills at its Newton Falls plant which will make a total of 20. The output is to consist largely of full finished sheets.

The Truscon Steel Co. will shortly commence construction of an important addition to its Youngstown plant, increasing its working force by approximately 20 per cent.

Much second quarter business is developing for valley steel producers.

Blast Furnace Resumption

The Port Henry, N. Y., furnace of the Witherbee, Sherman & Co. was put in blast on Feb. 12.

The stack of the Carbon Furnace Co. at Parryville, Pa., is being prepared for operation shortly.

The Delaware River Steel Co., Chester, Pa., has decided to put its furnace in blast this week.

Edgar Thomson Works, Carnegie Steel Co., Braddock, Pa., has made 13 new production records since Jan. 1. The showing on No. 4 mill has been notable. This mill in January surpassed by 1600 tons its best previous monthly tonnage of sheet bars made in 1917. This month this unit has made new turn, day and weekly records.

FABRICATED STEEL BUSINESS

Awards Total About 19,900 Tons with About 38,000 Tons Pending—New Tank Inquiries 17,500 Tons

Fabricated steel work awarded in the past week includes the following:

Printing building on Eighteenth Street, New York, 1300 tons, to Hinkle Iron Co.

Boiler house for Standard Oil Co. at Bayonne, N. J., 1000 tons, to Bethlehem Steel Co.

Bigelow Hartford Carpet Co., 400 tons, to American Bridge Co.

Loft building on Seventh Avenue, near Twenty-eighth Street, New York, 1600 tons, to Hedden Iron Construction Co.

Tanks for Texas Co., 7500 tons, to Petroleum Iron Works.

Packard Building, Fifteenth and Chestnut Streets, Philadelphia, 6000 tons, to Bethlehem Steel Co.; Thompson-Starrett Co., general contractor.

Interborough Co., New York, reconstruction work, 200 tons, to American Bridge Co.

Office building at Broadway and Liberty Streets, New York, 2700 tons, to Levering & Garrigues Co.

Work at Marcus Hook, Pa., 600 tons, to Shoemaker-Satterthwait Bridge Co., in addition to 600 tons recently awarded to the McClintic-Marshall Co.

Tanks for Sinclair company in Oklahoma, 8800 tons, to American Bridge Co.

Inspiration Copper Co. at Miami, Ariz., 1700 tons, awarded to Kansas City Structural Co. (mentioned indefinitely last week.)

Missouri, Kansas and Texas Railway of Texas, Bridges, Denison, Tex., 773 tons, to Wisconsin Bridge Co.

Joint Stock Land Bank, Kansas City, Mo., 708 tons, to American Bridge Co.

Simmons Co., warehouse, Pittsburgh, 400 tons, to Kenwood Bridge Co.

Chicago, St. Paul, Minneapolis & Omaha, White Bear Avenue viaduct, St. Paul, 329 tons, to American Bridge Co.

Glenn County, Cal., bridge over Stony Creek, 225 tons, to American Bridge Co.

Minneapolis & St. Louis, six 60-ft. girders and floor system, 285 tons, to unnamed fabricator.

Children's training school and dental clinic, 125 tons, to Holmes Pyott Foundry Co.

High school, Niagara Falls, N. Y., 200 tons, to Kellogg Structural Steel Co., Buffalo.

Hens & Kelly, department store addition, 400 tons, to Buffalo Structural Steel Co.

Commercial Building for Ohio State University, 200 tons, to Case Crane Co.

Buffalo, Rochester & Pittsburgh Railroad, bridges and bridge repair work, 1000 tons, to American Bridge Co.

Horses and props, dams Nos. 34 and 36, Ohio River, 600 tons, American Bridge Co. low bidder on part of this tonnage and American Car & Foundry Co. low bidder on remainder.

Dredge for the Government, about 400 tons, to the Charles Ward Co., Charleston, W. Va.

Transmission towers and poles for Detroit Edison Co., 1100 tons, to American Bridge Co.

Boston & Maine Railroad, Concord, N. H., locomotive shop, 184 tons, to American Bridge Co.

City of Cambridge, Mass., bridge, 100 tons, to Boston Bridge Works.

Indianapolis Light & Heat Co., plant, 300 tons to Hetherington & Berner, and 200 tons to Central States Bridge Co.

Machine shop, Link Belt Co., Chicago, 413 tons, to Morava Construction Co.

Pullman Co., paint shop, Pullman, Ill., 270 tons, to Union Foundry Co.

Auditorium and library for Teachers' College, Mankato, Minn., 147 tons, to St. Paul Structural Steel Co.

Annealing shop for South Side Malleable Casting Co., Milwaukee, 150 tons, to Lakeside Bridge & Steel Co.

Miscellaneous steel to New York & Pennsylvania Co., 100 tons, to Jones & Laughlin Steel Corporation.

Building for Indianapolis Light & Power Co., Indianapolis, 350 tons, to Central States Bridge Co.

Gas holder at Ypsilanti, Mich., 300 tons, to Stacey Mfg. Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Pan-American Petroleum Transport Co., San Pedro, Calif., tanks, involving 7500 tons, revived.

Inland Steel Co., open-hearth addition and new mill, Indiana Harbor, Ind., 7500 tons.

Commonwealth Edison Co., Crawford Street power station, Chicago, 10,000 tons.

Sinclair Refining Co., tanks for mid-continent field, 6000 tons.

Roxana Petroleum Co., tanks for mid-continent field, 3000 to 4500 tons.

Peoples Gas Light & Coke Co., Chicago, addition to Homa Avenue plant, 2000 tons.

Philo Power Co., Philo, Ohio, power plant, 2000 tons, bids being taken by Sargent & Lundy, Chicago.

R. R. Donnelly & Sons Co., Chicago, plant, Crawfordsville, Ind., 133 tons.

Grand Island, Neb., power station, 170 tons; Sargent & Lundy, engineers, Chicago.

St. Louis-San Francisco Railway, two 100-ft. turntables, 150 tons.

Plant for Cincinnati Galvanizing Co., 150 tons, bids being taken.

War Memorial Building, Nashville, Tenn., 950 tons, A. J. Krebs Co. awarded general contract.

Wittenberg Stadium, Springfield, Ohio, approximately 1000 tons of steel and 1000 tons of reinforcing bars, bids to be taken early in March.

Hotel at Jackson, Miss., 1100 tons, bids being taken.

Office building, Memphis, Tenn., 1000 tons, for Columbian Assurance Co., bids to be taken shortly.

Apartment, Germantown, Philadelphia, 1500 tons.

Medical Science Building, Ohio State University, 200 tons

Auditorium, Birmingham, 1200 tons.

Atlas Savings & Loan Co., Cleveland, bank, 150 tons.

Barnes Mfg. Co., Mansfield, Ohio, factory, 250 tons, bids taken.

Otis Steel Co., Cleveland, boiler house, 120 tons, bids in.

Atlas Foundry Co., Cleveland, 100 tons, bids in.

RAILROAD EQUIPMENT BUYING

Car Orders Total 735 and New Inquiries Include 1300 Cars and 49 Locomotives

The Delaware, Lackawanna & Western is inquiring for 300 double-sheathed automobile cars, 40-ton capacity.

The St. Louis-San Francisco is in the market for 1000 low-side gondolas.

The Interstate Railroad has ordered 500 hopper cars of 55-ton capacity from the Pressed Steel Car Co.

The Northern Pacific is inquiring for 25 mikado type, 20 Pacific type and 4 mallet type locomotives.

The Chicago, North Shore & Milwaukee has placed 20 general service cars with the Standard Steel Car Co. and 15 gondola cars with the General American Car Co.

The Minarets & Western has ordered 200 flat cars from the Pacific Car & Foundry Co.

Unfilled orders for railroad locomotives at the end of January totaled 1788 and were the largest recorded since monthly statistics were inaugurated at the beginning of 1920, according to figures of the Bureau of Census. Of this total only 89 were for foreign account. In December, 1922, unfilled orders totalled 1592, of which 94 were for foreign account, and in January, 1922, they totalled 207, of which 60 were for foreign account. Shipments in January of the present year totalled 229, of which 12 were for foreign account; shipments of December, 1922, totalled 210, of which 16 were for foreign account, and those of January, 1922, totalled 74, of which 63 were for foreign account.

The Inland Steel Co., Chicago, has asked for bids on the fabrication of approximately 4000 tons of steel for an open-hearth plant addition and 3500 tons for a new mill to be built at its No. 2 works at Indiana Harbor, Ind. The mill will roll merchant bars and possibly strip steel.

COMING MEETINGS

February

American Society for Steel Treating. Feb. 15 and 16. Winter sectional meeting, City Club, Chicago. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

American Institute of Mining and Metallurgical Engineers. Feb. 19 to 21, inclusive. Annual meeting, Engineering Societies Building, New York. Dr. F. F. Sharpless, 29 West Thirty-ninth Street, New York, secretary.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Old range non-Bessemer, 51½ per cent iron	5.20
Mesabi Bessemer, 55 per cent iron	5.70
Mesabi non-Bessemer, 51½ per cent iron	5.05

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., 55 to 58 per cent iron in dry Spanish or Algerian	11.50c.
Iron ore, Swedish, aver, 66 per cent iron	9.5c. to 10c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	35c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	32c.
Manganese ore, Brazilian or Indian	33c. to 34c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$7.50 to $8.50
Chrome ore, basic 48 per cent cr_2O_3, crude per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	60c. to 70c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace per ton	$107.50
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port	107.50
Spiegeleisen, domestic 19 to 21 per cent, furnace per ton	$36.00 to 37.00
Spiegeleisen, domestic 16 to 19 per cent, furnace per ton	34.00 to 36.00
Ferrosilicon, 50 per cent, delivered per gross ton	82.50 to 87.50
Ferrosilicon, Bessemer, 10 per cent, per ton furnace	45.50
Ferrotungsten, per lb. contained metal	90c. to 95c.
Ferrochrominum, 4 to 8 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c. to 14c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown

per gross ton

Rolling billets, 4-in. and over	$40.00
Rolling billets, 2-in. and under	40.00
Forging billets, ordinary carbons	45.00 to 47.50
Sheet bars, Bessemer	40.00
Sheet bars, open hearth	40.00
Slabs	40.00
Wire rods, common, soft base, No. 5	50.00
Wire rods screw stock	$5 per ton over base
Wire rods carbon 0.20 to 0.40	$3 per ton over base
Wire rods carbon 0.41 to 0.55	$5 per ton over base
Wire rods, carbon 0.56 to 0.75	$7.50 per ton over base
Wire rods, carbon over 0.75	$10 per ton over base
Wire rods, acid	$15 per ton over base
Skelp, grooved, per lb.	2.20c. to 2.25c.
Skelp, sheared, per lb.	2.20c. to 2.25c.
Skelp, universal, per lb.	2.20c. to 2.25c.

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton	$43.00
Rails, light new steel base, per lb.	2.15c. to 2.25c.
Rails, light, rerolled, base per lb.	2c. to 2.10c.
Spikes, 9/16-in. and larger, base, per 100 lb.	2.90c. to 3c.
Spikes, ½-in. and smaller, base, per 100 lb.	3.50
Track bolts, base, per 100 lb.	3.85c. to 4.00c.
Tie plates, per 100 lb.	$2.45 to 2.80
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb.	2.35c. to 2.50c.
Bars, rail, steel reinforcing base, per lb.	2c. to 2.10c.
Ground shafting, base, per lb.	3.05c.
Cut nails, base, per keg	$3.15

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per ton f.o.b. Illinois and Kentucky mines	$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per ton, f.o.b. Illinois and Kentucky mines	21.50

Per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$38.00 to $41.00
Ohio	40.00 to 42.00	35.00 to 38.00
Kentucky	40.00 to 42.00	37.00 to 40.00
Illinois	43.00 to 45.00	40.00 to 42.00
Missouri	48.00 to 50.00	38.00 to 43.00
Ground fire clay, per net ton	5.50 to 8.00	

Silica Brick:	
Pennsylvania	42.00
Chicago	47.00
Birmingham	48.00
Ground silica clay, per net ton	7.50 to 9.50
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00
Chrome Brick:	
Standard size, per net ton	50.00

Alloy Steel

S. A. E. series Numbers	Bars 100 lbs.
2100 (1¼% Nickel 10 to 20 per cent carbon)	$3.00
2300 (3½% Nickel)	5.50
2500 (5% Nickel)	8.00
3100 (Nickel Chromium)	4.50
3200 (Nickel Chromium)	6.25
3300 (Nickel Chromium)	8.50
3400 (Nickel Chromium)	7.50
5100 (Chromium Steel)	4.00
5200 (Chromium Steel)	7.25
6100 (Chromium Vanadium bars)	5.25
6100 (Chromium Vanadium spring steel)	5.00
9250 (Silico Manganese spring steel)	4.15
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.25
Chromium Molybdenum bars (0.70-1 Chromium, 0.25—0.40 Molybdenum)	5.25
Chromium Molybdenum spring steel (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.75

Above prices are for hot-rolled alloy steel bars, forging quality, per 100-lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

Government Offers Surplus Property at Columbus

A sale of surplus Government property will be conducted by the Central Surplus Property Control Officer at the General Reserve Depot, Columbus, Ohio, Friday, Feb. 16, at 10 a. m. The official auctioneers are A. T. Swepston Sons, Chillicothe, Ohio. The sale includes about 18 gross tons of cold-rolled strip steel of various sizes, about 63½ tons of iron bands of assorted lengths and thickness and 1444 hot-rolled steel sheets of Nos. 14, 15 and 16 gage. Other material to be sold includes small lots of motors, transformers, nuts, ½-in. iron links, pre-heaters, taps, wrenches, shovels, assorted pieces of toe-calk steel, iron screws, assorted drills and pipe fittings.

Further sales of surplus property are announced for Feb. 20, at the Philadelphia Quartermaster Intermediate Depot; Feb. 23, Schenectady General Reserve Depot; Feb. 27, Boston General Intermediate Depot; and March 9, St. Louis General Intermediate Depot 5.

Negotiations are well under way for the merger of the Bassick Co., Bridgeport, Conn., and the Bassick Mfg. Co., Chicago, together with the subsidiary firms of both concerns. The new company, to be known as the Bassick Alemite Co., will be organized under Delaware laws, with a capital of 200,000 shares of common stock of no par value and $5,000,000 preferred stock. No public sale of the securities will take place. The output will consist mainly of automobile and furniture hardware, as well as certain types of high pressure lubricating devices.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

For additional prices, see page 512

Plates

Sheared, tank quality, base, per lb.....2.20 to 2.35c.

Structural Material

Beams, channels, etc.....2.15c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.15c to 2.25c.
Refined iron bars, base, per lb.....2.75c.

Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb. 2.90c.
Hoops, light gage, under 1 in. wide.....3.00c. to 3.25c.
Bands, base, per lb..... 2.90c.
Strips, base, per lb..... 2.90c.

Cold-Finished Steels

Bars and shafting, base, per lb..... 2.65c.
Strips, base, per lb.....4.75c. to 5.00c.

Wire Products

Nails, base, per keg.....$2.80 to $3.00
Galvanized nails, 1 in. and over..... 1.50 over base
Galvanized nails, less than 1 in..... 2.00 over base
Bright plain wire, base, No. 9 gage per 100 lb..$2.65 to 2.75
Annealed fence wire, base, per 100 lb..... 2.80 to 2.90
Spring wire, base, per 100 lb..... 3.60
Galvanized wire, No. 9, 10 and 11 base, per 100 lb. 3.25 to 3.35
Galvanized barbed, base, per 100 lb..... 3.55 to 3.80
Galvanized staples, base, per keg..... 3.55 to 3.75
Painted barbed wire, base, per 100 lb..... 3.20 to 3.30
Polished staples, base, per keg..... 3.20 to 3.30
Cement coated nails, base, per count keg..... 2.30 to 2.50
Woven fence, carloads (to jobbers).....69 per cent off list
Woven fence, carloads (to retailers).....66⅔ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads..60 and 5 per cent off list
Machine bolts, small, cut threads....50 and 10 per cent off list
Machine bolts, larger and longer.....50 and 10 per cent off list
Carriage bolts, ⅝ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 5 per cent off list
Cut threads .....50 per cent off list
Longer and larger sizes.....50 per cent off list
Lag bolts .....60 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 per cent off list
Larger and longer sizes.....45 per cent off list
Hot pressed square or hex. blank nuts...$3.25 to $3.50 off list
Hot pressed nuts, tapped..... 3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.25 to 3.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S....75, 10 and 5 per cent off list
⅝ in. and larger, U. S. S....70, 10 and 2½ per cent off list
Small sizes, S. A. E.....80 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire Bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws.....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb..... 3.10
Small rivets .....65 and 10 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.... 2.90c.
Spikes ½ in. and smaller, per 100 lb..... 3.50c.
Spikes, boat and barge, base, per 100 lb..... 3.50c.
Track bolts, base, per 100 lb.....3.85c. to 4.50c.
Tie plates, per 100 lb.....2.45c. to 2.60c.
Angle bars, base, per 100 lb..... 2.75c.

Welded Pipe

Butt Weld

Inches	Steel Black	Steel Galv.	Inches	Iron Black	Iron Galv.
⅛	47	21½	⅛ to ¼	+11	+39
¼ to ⅜	53	27½	½	22	2
½	58	44½	¾	28	11
¾	62	50½	1 to 1½	30	13
1 to 3	64	52½			

Lap Weld

2	57	45½	2	23	7
2½ to 6	61	49½	2½	26	11
7 to 8	58	45½	3 to 6	28	13
9 to 12	57	44½	7 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ to ⅜	+19	+54
¼ to ⅜	49	32½	½	21	7
½	55	44½	¾	28	12
¾	60	49½	1 to 1½	30	14
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	23	9
2½ to 4	59	48½	2½ to 4	29	15
4½ to 6	58	47½	4½ to 6	28	14
7 to 8	54	41½	7 to 8	21	7
9 to 12	48	35½	9 to 12	16	2

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	21½	1½ in.	+12
2 to 2¼ in.	33	1⅝ to 1⅞ in.	+ 2
2½ to 3 in.	44	2 to 2¼ in.	— 8
3¼ to 13 in.	49	2½ to 3 in.	—13
		3¼ to 4½ in.	—15

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	55	2½ and 2¾ in.	35
1¼ and 1½ in.	47	3 in.	39
1¾ in.	31	3½ to 4 in.	44
2 and 2¼ in.	31	4½ in. and 5 in.	36

Hot Rolled

3 in.	41	3½ to 4 in.	46

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....85 per cent off list
Carbon 0.30 to 0.40, base.....83 per cent off list
Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	14	2¼-in. O.D. 10 gage	19
2-in. O.D. 11 gage	15	3-in. O.D. 7 gage	34
2-in. O.D. 10 gage	16	1½-in. O.D. 9 gage	13¾
2¼-in. O.D. 12 gage	16	5⅝-in. O.D. 9 gage	53
2¼-in. O.D. 11 gage	17	5½-in. O.D. 9 gage	55

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$ 9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35 to 3.60c.
Regular auto body sheets, base (22 gage), per lb., 4.70c. to 5.00c.

Galvanized

No. 28 (base), per lb.....4.35 to 4.75c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.60c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	$0.325	Buffalo	$0.265	St. Louis	$0.43	Pacific Coast	$1.50
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	Pac. Coast, ship plates	1.20
Baltimore, domestic	0.315	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705	Birmingham	0.69
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60	Memphis	0.385
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735	Jacksonville, all rail	0.50
New York, export	0.255	Indianapolis	0.31	Omaha (pipe)	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Chicago	0.34	Denver	1.27	New Orleans	0.515
Boston, export	0.255			Denver (pipe)	1.215		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lbs., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i. e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 30c. to 40c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

British Iron and Steel Market

Large Inquiries, but Few Buyers—Continental Demand Heavy but Business Almost Impossible —More Continental Furnaces Shut Down —Exports for January

(By Cable)

LONDON, ENGLAND, Feb. 13.

There is acute shortage of all grades of pig iron. Spot supplies of No. 3 G.M.B. have been sold at £5 12½s. ($26.33); of Cleveland basic iron at £5 7½s. ($25.16). East Coast mixed numbers have been sold at £5 3s. ($24.10), but sellers are now asking higher figures for March and April delivery. Good sales have been made to Germany, Italy and the United States.

Foreign ores are firmer. Sellers of best Bilbao Rubio are asking 24½s. to 25s. ($5.73 to $5.85), c.i.f. Tees. Germany is reported as negotiating for 1,000,000 tons of Wabana ore.

Finished steel is quieter, though large inquiries continue, but buyers generally are hesitating to pay the advanced prices. North East Coast plants are in want of orders for plates and sections.

Continental business is almost impossible. There is strong demand for all kinds of material but few works are quoting. Odd lines of German plates have been sold at £6 12½s. (1.39c. per lb.), f.o.b. 14 days. Czechoslovakia is offering merchant bars at £7 15s. to £8 (1.62c. to 1.67c. per lb.), f.o.b. German rails are quoted at £9 to £9 5s. ($42.12 to $43.29), f.o.b.

In Luxemburg, the Société Anonyme d'Ougrée Marihaye has blown out the second furnace at Rodange. In Belgium, furnaces are reducing operations by 20 to 25 per cent. The Société Anonyme d'Athus-Grivegne has blown out one furnace, as has the Société Anonyme des Hauts Fourneaux du Sud de Chatelineau. In Germany, Maximilianshütte has banked one furnace at Unterwellenborn. In France, the Société Anonyme des Hauts Fourneaux et Fonderies de Pont-a-Mousson has banked one furnace at d'Auboué. Pompey (Meurthe-et-Moselle) has banked one blast furnace but has relighted one open-hearth furnace. The Acieries de Longwy has blown out a second furnace.

Tin plate is firm, with sellers asking 21½s. ($5.03) basis, f.o.b. Sheet bars makers are not keen sellers below £8 11s. ($40.01) and an official price increase is anticipated.

Galvanized sheets are strong, though business is quieter. Corrugated sheets of 24-gage are being sold at £19 5s. (4.02c. per lb.), f.o.b., to Indian specifications.

There is continued heavy demand for black sheets, from the Far East. Prices are advancing. Japanese specifications are being sold at £18 (3.76c. per lb.), f.o.b.

Pig iron exports for January (including ferroalloys) totaled 72,978 tons, the amount sent to the United States not being reported as yet. Total iron and steel exports in January aggregated 353,389 tons.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.86 per £1, as follows:

Durham coke, delivered	£1	13½s.	to £1	14½s.	$7.84	to	$8.08
Cleveland No. 1 foundry	5	10	(nominal)		25.74		
Cleveland No. 3 foundry	5	5			24.57		
Cleveland No. 4 foundry	5	0			23.40		
Cleveland No. 4 forge..	4	15			22.23		
Cleveland basic	5	7½			25.16		
East Coast mixed.....	5	5	to 5	7½	24.57	to	25.16
Ferromanganese	15	0			70.20		
Ferromanganese*	15	0			70.20		
Rails, 60 lb. and up...	8	10	to 9	0	39.78	to	42.12
Billets	7	0	to 8	0	32.76	to	37.44
Sheet and tin plate bars, Welsh	7	15¾	to 8	11	36.45	to	40.01
Tin plates, base box...	1	1	to 1	1½	4.91	to	5.03
					C. per Lb.		
Ship plates	8	15	to 9	5	1.83	to	1.93
Boiler plates	11	0	to 11	10	2.30	to	2.40
Tees	9	15	to 10	5	2.04	to	2.14
Channels	9	0	to 9	10	1.88	to	1.99
Beams	8	15	to 9	5	1.83	to	1.93
Round bars, ¾ to 3 in.	10	0	to 10	10	2.09	to	2.19
Galvanized sheets, 24 g.	19	0	to 19	5	3.97	to	4.02
Black sheets, 24 gage..	13	5			2.77		
Black sheets, Japanese specifications	15	5			3.19		
Steel hoops	11	0	& 12	10*	2.30	&	2.61*
Cold rolled steel strip, 20 g.	23	0			4.81		
Cotton ties, Indian specifications	15	0			3.13		

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

Merchant bars:			C. per Lb.
Belgium, Feb., Mar..	£7	7s.	1.54

No other quotations.

Niles-Bement-Pond Earnings

In the annual report of the Niles-Bement-Pond Co. for 1922 a net loss of $2,993,450, after expenses and taxes, is shown, as compared with a loss of $2,737,434 in the previous year. Manufacturing loss was $1,676,584, comparing with $1,150,866 in 1921. A comparative statement appears below:

	1922	1921
Total loss.....	$1,520,372	$842,416
Expenses, taxes, etc.....	1,473,078	1,895,018
Net loss.....	2,993,450	2,737,434
Dividends	238,248	620,925
Deficit	3,231,698	3,358,359
Total surplus.....	9,418,224	12,469,923

The Transue & Williams Steel Forging Corporation reports for 1922 a deficit, after charges, of $71,137, compared with a deficit of $256,862 in 1921. Gross sales were $1,170,183. No dividends were paid during the year. In the preceding year the company's gross sales were $3,665,444 and earnings before dividends were $43,138.

Net earnings of the Continental Can Co., Inc., last year were $4,438,508; in 1921 they were $1,529,042. After depreciation and taxes there was a balance of $3,161,603, which after preferred dividends is equal to $7.97 per share on the $360,000 common shares. In 1921, the company earned $3.75 on its common stock. At the close of 1922, the profit and loss surplus stood at $3,225,747, contrasted with $5,069,314 at the end of 1921.

Condition in Machine Tool Industry Reflected

The condition of the machine tool industry during 1922 is clearly reflected in the earnings statement of the Niles-Bement-Pond Co. for that period. A manufacturing loss of $1,676,584 is shown, whereas in 1921 there was a loss of approximately $1,500,000. With dividends paid more than halved last year, the final deficit was $3,231,698, bringing the profit and loss surplus down to $9,418,224, as against $12,469,923 at the close of 1921. The 1922 income account compares as follows:

	1922	1921
Manufacturing loss.....	$1,676,584	$1,150,866
Miscellaneous income.....	156,212	308,450
Total loss.....	1,520,372	842,416
Extra tax, etc.....	1,473,078	1,895,018
Net loss	2,993,450	2,737,434
Dividends	238,248	620,925
Deficit	3,231,698	3,358,359
Profit and loss surplus.....	9,418,224	12,469,923

James K. Cullen, president Pratt & Whitney Co., Hartford, Conn., in a statement to the stockholders said in part: "The deplorable conditions that have prevailed in the machine tool industry at home and abroad since 1920 continued throughout the greater part of 1922. During the past few months the volume of our sales has increased materially, but the price situation throughout the industry is still gravely demoralized, and the prospects of a profitable business in the immediate future are not yet bright. The matter of Federal income taxes for the years 1917-1920 has not yet been fully settled."

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Feb.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
7	15.12½	14.75	40.25	8.10	8.10	7.40	7.05
8	15.12½	14.75	40.25	8.10	8.10	7.40	7.05
9	15.12½	14.87½	40.45	8.10	8.10	7.40	7.05
10	15.25	14.87½	41.25	8.10	8.10	7.40	7.05
13	15.25	14.87½	41.25	8.10	8.10	7.40	7.05

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Feb. 13.

Lincoln's birthday has made very little difference with the general course of the markets which continue moderately active and firm. Copper has advanced and tin is also higher. The lead market is unchanged but the tendency in zinc is higher.

Copper.—Electrolytic copper has sold to new high levels at 15.12½c., delivered, with some companies realizing 15.25c. Sales have been of very good proportions and the market is moderately active with the minimum price at the lower level. Sales for export have also been good and the price is higher at about 15.20c. to 15.25c., delivered on the other side. Lake copper is also stronger at 15.12½c. to 15c., delivered.

Tin.—Up until last Friday the market was exceedingly quiet with sales aggregating about 200 tons, due partly by a desire by two sellers to do business in February-March delivery, which resulted in some competing but with very little price cutting. Last Friday and Saturday were interesting days. On Friday a sudden change took place which resulted in sales of about 800 tons, spot metal going at 40.37½c. to 40.50c., and shipments from the East at 40.37½c. Early in the day March-April-May shipments were dealt in at 40.20c., which was the low point with June shipments selling later at 40.62½c. On Saturday a rumor that the steamer City of Canton was in distress created some excitement, with the result that there was active buying amounting to about 250 tons, spot selling at 41.25c., February at 41c. and later arrivals at 40.75c. Today a very moderate business was done with spot Straits quoted at 41.25c., New York, the highest price since 1920. London quotations today were about £3 per ton higher than a week ago at £186 15s. for spot standard, £188 7s. 6d. for future standard and £190 15s. for spot Straits. Arrivals thus far this month have been 1235 tons, with 9575 tons reported afloat.

Lead.—The market is not quite as strong as it has been, but prices are firm at 8c. to 8.10c., New York, the former price being that of the leading interest. Quotations are 8.10c., St. Louis, in the outside market. Consumption continues very heavy but demand is good and more metal is available than recently.

Zinc.—A firmer tendency is detected for prime Western and quotations are tending higher, although sales have not been made at any higher figure than reported a week ago. Metal for spot delivery continues scarce and quotations are more or less nominal at 7.05c. to 7.10c., St. Louis, or 7.40c. to 7.45c., New York. Business has been done for March delivery at 7c., St. Louis, and for April at 6.90c. to 6.95c., St. Louis. There has been considerable inquiry for shipment to England and one sale of at least 1500 tons is noted. Galvanizing demand is also good.

Antimony.—Wholesale lots of Chinese metal for early delivery are unchanged at 7.12½c. per lb., New York, duty paid, with the market firm.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are quoted at 23c. to 24c., per lb., New York, duty paid, for early delivery by importers of the foreign product. No quotations are available from the leading domestic producer.

Old Material.—Business continues good with a very firm market. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	14.50
Copper, heavy and wire	13.50
Copper, light and bottoms	12.00
Heavy machine composition	11.50
Brass, heavy	9.50
Brass, light	7.25
No. 1 red brass or composition turnings	10.50
No. 1 yellow rod brass turnings	8.25
Lead, heavy	7.25
Lead, tea	6.00
Zinc	5.00

Chicago

Feb. 13.—The metals are quiet with tin higher and lead lower. A fair quantity of copper has changed hands, but without affecting prices. Attempts to sell lead for future delivery at above current quotations have been largely successful. Stocks of lead are not great but production appears sufficient to take care of current demands and foreign lead now en route is expected to result in an easier situation. Among the old metals a number of grades of copper and brass have advanced. We quote, in carload lots, lake copper, 15.25c.; tin, 41.50c.; lead, 8.15c.; spelter, 7.10c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12.50c.; copper bottoms, 10.75c.; red brass, 9.75c.; yellow brass, 7.75c.; lead pipe, 6.50c.; zinc, 4.75c.; pewter, No. 1, 25c.; tin foil, 27c.; block tin, 34c., all buying prices for less than carload lots.

St. Louis

FEB. 13.—Lead held about steady for the week at 8.10c. to 8.15c., carlots, against 8.15c. last week, while slab zinc was lower at 7c. to 7.05c., against 7.10c. last week. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7.50c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 3c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c.; aluminum, 9c.

PIG IRON IMPORTS

Heavy Movement in the First Forty Days of the New Tariff Law

WASHINGTON, Feb. 13.—Marking what is said to have been a record movement, imports of pig iron for the 40-day period from Sept. 22 to Oct. 31, 1922, inclusive, totalled 120,779 gross tons. For the ten months ended with October, iron imports aggregated 229,950 tons. In the 40-day period imports of ferromanganese amounted to 11,229 tons and for the ten months they were 83,240 tons. Imports of manganese ore for the respective periods were 22,523 tons and 350,160 tons.

These figures were disclosed today when for the first time imports under the present tariff law became available. The heavy incoming movement of pig iron, ferromanganese and manganese ore, despite the tariff duties, has been a matter of considerable comment, although the tariff on pig iron is only 75c. and one explanation is that the greater part of the shipments had moved before the tariff went into effect at midnight, Sept. 21.

Of the total pig iron imports for the 40-day period, 56,536 tons came from England, 28,715 tons from Scotland, 17,017 tons from France and 15,777 tons from Belgium. Of the total ferromanganese imports for the same period, 11,128 tons came from England.

A New York-Chicago joint session will be a feature of the convention of the American Institute of Electrical Engineers, to be held in New York, Feb. 14 to 17. The two cities will be in direct telephone connection and two papers will be delivered and discussed.

PERSONAL

Clyde M. Carr has retired as president of Joseph T. Ryerson & Son, large jobber of iron and steel and machinery, with main offices at Chicago. Owing to poor health, Mr. Carr has been unable to take an active part in the management of the company for the past two years. He will continue, however, as a director. At the recent regular annual meeting of the board of directors, Joseph T. Ryerson was elected president to succeed Mr. Carr. Mr. Ryerson is a grandson of the original Joseph T., and has a background of 22 years in the steel business. He was born in Chicago in 1880, and immediately upon graduation from Yale University in 1901, went to work for the American Sheet Steel Co., now the American Sheet & Tin Plate Co., at its mill in Vandergrift, Pa. In October, 1902, he entered the service of Joseph T. Ryerson & Son at Chicago, and in 1904 was elected treasurer. In 1911 he became vice-president. Mr. Carr was born in Illinois in 1869 and first became associated with Joseph T. Ryerson & Son in 1890. Throughout his connection with the company, he has taken a very active part in the management of its affairs, and was elected president in 1911. Both Mr. Carr and Mr. Ryerson have important outside interests. Mr. Carr is president of the Orchestral Association, Chicago; director of the Corn Exchange National Bank, Chicago; trustee of the Art Institute, Chicago, and the Chicago Plan Commission, member of the American Iron and Steel Institute, and member of various clubs in Chicago and New York. Mr. Ryerson has taken an active part in the work of the Chamber of Commerce of the United States, is a director of the People's Trust & Savings Bank, Chicago, and of the Morris Plan Bank of Chicago. He is also a member of the American Iron and Steel Institute, the Industrial Club of Chicago, and other clubs and associations in Chicago and New York.

JOSEPH T. RYERSON

CLYDE M. CARR

W. W. Lewis has been appointed open hearth superintendent at the Ashland Division works of the American Rolling Mill Co. Mr. Lewis entered the employ of the American Rolling Mill Co. six years ago as assistant superintendent of the open hearth department at Middletown. Since that time he has been in Europe doing special work for the company, and latterly had charge of sales development work.

John A. Topping, chairman Republic Iron & Steel Co., is scheduled to leave New York, Feb. 15, for a number of weeks stay at Nassau, Bahama Islands.

Ralph E. Espy has purchased the interests of H. W. Norton in the Burgess-Norton Mfg. Co., Geneva, Ill., manufacturer of piston pins. Mr. Espy has been elected secretary of the company and will have charge of sales.

Harry J. Hair, formerly in charge of the Pittsburgh district office of Manning, Maxwell & Moore, Inc., has joined the sales force of the Lamson Co., Syracuse, N. Y.

W. H. Winterrowd has been appointed assistant to the president of the Lima Locomotive Works, with headquarters at 17 East Forty-second Street, New York. He graduated in 1907 from Purdue University. In 1908 he went with the Lake Erie, Alliance & Wheeling as engine-house foreman, at Alliance, Ohio. The following year he became night engine-house foreman of the Lake Shore & Michigan Southern, at Youngstown, Ohio, and in 1910, was made roundhouse foreman at Cleveland. Later in the same year he was promoted to assistant to the mechanical engineer of the Lake Shore. Since September, 1912, he has been with the Canadian Pacific, first as mechanical engineer and later as assistant chief mechanical engineer, and in 1918 was appointed chief mechanical engineer, which position he held to the time of his appointment with the Lima Works. He is a member of the mechanical section of the American Railway Association and the American Society of Mechanical Engineers.

W. H. WINTERROWD

Adolph Dyckerhoff, formerly in the steam engineering department of the Illinois Steel Co., South Chicago, Ill., recently left that company to become associated with Sargent & Lundy, consulting electrical engineers, Chicago.

Ward B. Perley, vice-president Canadian Steel Corporation, Ltd., Ojibway, Ont., has been elected a director of the Toledo Times Publishing Co., Toledo, Ohio.

W. A. BARROWS, JR.

W. A. Barrows, Jr., who since September, 1916, has been president and general manager of the Thomas Iron Co., ownership of which recently passed to the Reading Iron Co., and J. E. Rotthaus, assistant to the president of the Thomas Iron Co., announce their retirement and the formation of the firm of Barrows & Rotthaus, which will engage in the selling of pig iron, iron ore, coal and coke, in Philadelphia. Offices have been engaged at 807-809 Widener Building, that city. Donald Barrows, son of W. A. Barrows, Jr., will be associated with the new firm.

Among those American business men who will represent the United States at the second general meeting of the International Chamber of Commerce to be held in Rome, Italy, from March 18 to 24 are: Julius H. Barnes, president Chamber of Commerce of the United States and president Barnes-Ames Co., Duluth; A. J. Brosseau, president International Motor Co., New York; C. E. Bunting, Bunting Brass & Bronze Co., Toledo; William Butterworth, president Deere & Co., Moline, Ill.; and Frank L. Fay, president Greenville Steel Car Co., Greenville, Pa. They will leave on the steamer Caronia, Feb. 17, as part of the delegation of 200.

W. E. Mills has been elected vice-president and general manager of the Hadfield-Penfield Steel Co., Bucyrus, Ohio, succeeding R. C. Penfield, who has resigned in order that the Hadfield interests which have acquired control of the plant, may have charge of its active management. Mr. Mills has been associated with the Hadfield interests in Sheffield, England, for a number of years, and has been assistant general manager of the Hadfield, Ltd., plant at Sheffield. Mr. Penfield will devote his attention to the American Equipment Co., which is a subsidiary of the Hadfield-Penfield Steel Co.

Paul T. Buckler, for 14 years with the Detroit Stoker Co., as manager successively of the Pittsburgh, Cleveland and New York offices, is now with the Power Specialty Co., for whom he is assisting the New York office in the sale of Foster superheaters and economizers.

Gen. Otto H. Falk, president Allis-Chalmers Mfg. Co., and vice-president Falk Corporation, Milwaukee, will sail from New York on Feb. 20 for Naples, accompanied by his son, Otto H. Falk, Jr. They will meet Mrs. Falk and daughter, who are touring Europe, and spend Easter in Rome, returning to Milwaukee about June 5.

OBITUARY

Alexis W. Thompson

ALEXIS W. THOMPSON, who died of heart failure at the Battle Creek Sanitarium, Battle Creek, Mich., on Feb. 8, was for many years a prominent figure in the iron and steel industry. He was born in Mercer County, Pa., Nov. 30, 1850, and received his education in the public schools of Mercer County and Ashtabula County, Ohio. In early life he was associated with the late Peter L. Kimberly and Edward N. Ohl in New Castle, Pa. From 1875 to 1893 he was secretary and treasurer of the Etna Iron Works, Ltd., New Castle, Pa., and then for six years vice-president of the Atlantic Iron & Steel Co. At the formation of the Republic Iron & Steel Co. he became vice-president, retaining that position until September, 1901, when he was elected president. This position he held until October, 1905. In the following April he joined the Inland Steel Co., to whose presidency he was subsequently elected. He remained active in that capacity until he retired in 1919, but still served as a director for a time. Mr. Thompson was also a director of the Sharpsville Furnace Co., Sharpsville, Pa., and the United Iron & Steel Co., and a director and member of the executive committee of the Benson Mines Co. He was a charter member of the American Iron and Steel Institute. Funeral services were held at New Castle, Pa., on Feb. 10.

ALEXIS W. THOMPSON

HORACE T. POTTS, for 56 years head of Horace T. Potts & Co., Philadelphia, iron and steel merchants and importers, died of pneumonia on Feb. 8. He was born in Philadelphia in 1844. His grandfather, William Lukens Potts, founded the business in 1815, and upon the death of his father, Thomas I. Potts, in 1866, he had succeeded him, and until a few years ago, when he placed responsibilities largely upon his sons, he had been in close touch with business affairs. While Mr. Potts was always active in the conduct of the firm bearing his name, he found time for many outside interests, being president of the Consolidation National Bank of Philadelphia for a number of years, and of the Second & Third Streets Passenger Railway of Philadelphia for 27 years. He was also a director of a number of banks, trust companies, fire insurance companies and street railway companies. He assisted in the organization of the Philadelphia Chamber of Commerce, and was for many years one of its most active directors. He is succeeded in business by four of his sons, Harrison I., Thomas C., Horace M. and Charles William Potts.

ROBERT HENRY HACKNEY, founder and president of the Press Steel Tank Co., Milwaukee, and widely known as the pioneer in the seamless steel barrel industry, died on Feb. 5 at the age of 53 years. He was born in Milwaukee and was graduated from the University of Wisconsin in 1893, entering the employ of the Pressed Steel Car Co. and advancing to the position of superintendent of the Joliet Works. Mr. Hackney returned to Milwaukee in 1901, purchased the assets of the Seamless Structural Co., and organized the Pressed Steel Tank Co., which he developed into one of the largest industries of its kind in this country. He was a member of the American Society of Mechanical Engineers.

MILTON F. WILLIAMS, president Williams Patent Crusher & Pulverizer Co., St. Louis, died there on Feb. 7 from a complication of diseases. He was 77 years old and was born in Ohio. He came to St. Louis more than fifty years ago as a millwright. Later he started a small machine shop. He originated the swing hammer crusher and pulverizer in 1895, and incorporated under the present name two years later. He leaves a widow; three sons, Milton Judson, Arthur F. and Oliver J. Williams; and one daughter, Mrs. John C. Chandler.

A. H. BAUMAN, vice-president Cleveland Duplex Machinery Co., Inc., Cleveland, died of influenza on Sunday, Feb. 4, at the East 105th Street Hospital, that city. He was born in Fremont, Ohio, thirty-two years ago, and after graduation from high school, served an apprenticeship in the shops of the Lake Shore Electric Co., later coming to Cleveland, where he became a tool maker in the White Motor Co. plant. His services were requisitioned during the World War, and he was made general foreman of the gun shop of the American Brake Shoe Co. at Erie, Pa. At the close of the war Mr. Bauman became affiliated with the Cleveland Duplex Machinery Co. and was elected to the vice-presidency in October, 1921.

GEORGE A. DRAPER, president Draper Corporation, textile machinery, died at the Massachusetts General Hospital, Boston, on Feb. 7.

H. FRANK WOOD, secretary J. M. Warren & Co., Troy, N. Y., died on Jan. 30, at his home in that city. He was born in Janesville, Wis., in 1853, but came to Troy when he was four years old. Mr. Wood entered the employ of Joseph M. Warren & Co., when 16 years of age and remained with the company throughout his career, becoming a director in 1898 and secretary in 1911.

GEORGE E. TURNER, president and treasurer Turner-Fricke Mfg. Co., Pittsburgh, died at his home in that city on Feb. 1. He was born in Lockport, N. Y., 55 years ago and was graduated from Cornell University in 1893. He had been a resident of Pittsburgh since 1900.

JOHN F. GEARY, well-known foundryman and specialist in making radiator castings, died suddenly at North Tonawanda, N. Y., on Dec. 13.

JOHN T. ANDERSON, general manager Davenport Machine & Foundry Co., Davenport, Iowa, died on Sunday, Jan. 28.

DAVID E. TRACEY, former president Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., died at Colon, Panama, Feb. 11. Mr. Tracey, accompanied by his wife, left Harrisburg Feb. 2 for a trip to South America and had planned to be gone three months. In addition to holding a prominent place in industrial and civic activities of Harrisburg, he was known for his philanthropies.

Machinery Markets and News of the Works

LARGE RAILROAD LIST

St. Louis-San Francisco Issues Inquiry for 88 Machines

Tools Continue Fairly Active, Especially in Central States

The St. Louis-San Francisco Railway has issued an inquiry for 88 machines of various types. This is the largest railroad list on which the trade has figured in some time. Bids close Feb. 19. Other railroad business is on a moderate scale. The New York Central is getting figures on about 20 small machines. The Missouri, Kansas & Texas is in the market for six tools and some other roads are inquiring for a few tools each.

It is now possible to report one of the largest machine-tools sales in recent months, involving 50 gear-hobbing machines which went to a gear manufacturer in the Middle West. The order totaled about $100,000.

The Westinghouse Electric & Mfg. Co. is an active buyer at Pittsburgh. Its list, which has only partially been purchased, includes about 100 items for its various plants. The McClintic-Marshall Co. has also been buying machines at Pittsburgh for its bolt and rivet plant at McKees Rocks, Pa. The Guilbert Steel Co., Pittsburgh, has bought steel fabricating equipment, but still has a number of machine tools to buy.

The Ford Motor Co., Detroit, has placed orders for a round lot of multiple-spindle high-speed drilling machines with a total of about 150 spindles. The Crane Co., Chicago, has bought 21 small turret lathes for working in brass.

The Sullivan Machinery Co., Chicago, is in the market for equipment for its new plant at Michigan City, Ind. The Gilson Mfg. Co., Port Washington, Wis., has bought a round lot of equipment to replace machines damaged by fire.

In the East the principal buying has been by the General Electric Co. and the Adams Axle Co., Findlay, Ohio, for a plant at Syracuse, N. Y.

New York

NEW YORK, Feb. 13.

FEBRUARY has not brought any marked improvement in the volume of machine-tool buying in the New York district. There is a lack of inquiry in some lines, and in many respects the situation is disappointing to sellers. The Adams Axle Co., Findlay, Ohio, has bought a number of machines for its new plant at Syracuse, N. Y. The General Electric Co., Schenectady, N. Y., continues to buy. Otherwise current trade is confined to small orders and inquiries. The New York Central Railroad has issued an inquiry for about 20 small machines.

The crane market is decidedly active both in purchases of electric and hand power overhead cranes and locomotive cranes. Much of the locomotive crane business, however, is from the West and South. Inquiries continue to appear covering a fairly wide range of capacities. It is reported that the used equipment in the locomotive crane market is becoming scarce, which is expected to contribute to an improvement in sales of new cranes. The Quebec Development Co., which has purchased two 25-ton locomotive cranes from the Industrial Works, has also taken an option on a 40-ton locomotive crane for its Canadian development.

Among current inquiries for electric overhead cranes is a request for bids from the General Electric Co., Schenectady, N. Y., on 100-ton, 30-ton, 10-ton and 7½-ton, overhead traveling cranes for the Schenectady shops, and an inquiry for a 5-ton overhead crane for its New Kensington, Pa., shops. It is reported that there is also an inquiry in the market for several cranes for the West Lynn, Mass., shops of the company. The Eastern Steel Casting Co., Elizabeth, N. J., is receiving bids on two 10-ton electric cranes for its foundry and several electric hoists. Merrill Brothers, Maspeth, L. I., are in the market for a 15-ton overhead traveling crane, preferably used equipment.

Among recent purchasers are:

Greenfield Electric Light Co., Greenfield, Mass., a 15-ton hand power crane from the Whiting Corporation;

Power Construction Co., Worcester, Mass., a 60-ton, 30-ft. span, 4-motor overhead traveling crane for installation at Readsbora, N. H., from the Whiting Corporation;

Boston & Maine Railroad, a 200-ton locomotive hoist for new shops at Concord, Mass., from the Whiting Corporation;

Mountain Ice Co., Newark, N. J., a 7½-ton electric crane from the Detroit Hoist & Machine Co.;

Pottstown Iron Works, Pottstown, Pa., a 15-ton electric traveling crane from the Niles-Bement-Pond Co.;

Rigg Cut Stone Co., Windsor, Ont., a 6-ton, 3-motor electric traveling crane from the Northern Engineering Works;

Ulen Contracting Co., Allaben, N. Y., a 10-ton, 38-ft. span electric traveling crane and two 3-ton hand power cranes from the Northern Engineering Works;

Dwight P. Robinson & Co., 61 Broadway, New York, three 2-ton, single I beam cranes for the Walworth Mfg. Co., from the Chisholm-Moore Mfg. Co.;

Quebec Development Co., temporary buying office at Southern Power Co., Charlotte, N. C., two 25-ton locomotive cranes and an option on a 40-ton locomotive crane from the Industrial Works;

Illinois Central Railroad, Chicago, a standard 150-ton wrecking crane from the Industrial Works;

Buffalo, Rochester & Pittsburgh Railway Co., Rochester, N. Y., a No. 3 pile driver to handle 7000-lb. piles from the Industrial Works;

Canadian Pacific Railroad, a No. 3 pile driver from the Industrial Works;

Denver & Rio Grande Railroad, a 75-ton wrecking crane from the Industrial Works;

Streator Car Co., Chicago, a 20-ton, 40-ft. boom, bucket handling locomotive crane from the Industrial Works;

Baldwin Locomotive Works, Philadelphia, Pa., two 40-ton, 46-ft. span, double trolley overhead traveling cranes reported to have been bought from the Niles-Bement-Pond Co.

Philip T. King, 30 Church Street, New York, dealer in used cranes, reports sales of used locomotive cranes in the past three weeks to the following companies: United States Steel Corporation, two 30-ton, 50-ft. boom, Industrial locomotive cranes; Wisconsin Iron & Steel Co., Madison, Wis., a 20-ton, 55-ft. boom, Brownhoist locomotive crane; Reading Iron Co., Reading, Pa., a 30-ton, 50-ft. boom, Browning locomotive crane; Commonwealth Steel Co., St. Louis, Mo., a 50-ton Industrial wrecking crane; Long Island Railroad Co., a 25-ton, 50-ft. boom, Ohio locomotive crane; Public Service Production Co., Newark, N. J., a 30-ton, 90-ft. boom, Industrial locomotive crane; Jay-Kay Stevedoring Co., Norfolk, Va., a 30-ton, 60-ft. boom Ohio and two 15-ton, 45-ft. boom Industrial locomotive cranes; Norfolk & Western Railroad Co., Norfolk, Va., two 20-ton, 50-ft. boom, Brownhoist loco-

motive cranes; and the Clarke Mfg. Co., Newark, N. J., a 25-ton industrial and a 30-ton Ohio, 50-ft. boom.

The Soss Mfg. Co., Brooklyn, is in the market for a second-hand 18 in. Gould & Eberhardt shaper and a 3 hp. General Electric compound wound 230 volt type RC 1150 r.p.m., 50 degree, electric motor.

The United States Navy Purchasing Office, South and Whitehall Streets, New York, will take bids at once for 200 piston rings, also for safety and other valves.

The United States Cast Iron Pipe & Foundry Co., 71 Broadway, New York, is arranging for an addition to its plant at Burlington, N. J. Enlargements will also be made in the foundry at Birmingham.

Jenkins Brothers, 80 White Street, New York, manufacturer of valves, mechanical rubber products, etc., is disposing of a bond issue of $1,000,000, the larger part of the proceeds to be used for an addition to its plant at Bridgeport, Conn. It will be equipped for the manufacture of cast steel and iron valves, now being purchased from outside sources.

The Frankfort Heating Co., 4418 Thirteenth Avenue, Brooklyn, manufacturer of heating equipment, has plans for a new building, 100 x 100 ft., at Fourteenth Avenue and Thirty-ninth Street. Shampan & Shampan, 188 Montague Street, are architect.

The Atlas Novelty Co., 722 East Eleventh Street, New York, manufacturer of metal and composition products, has purchased property at Freeman Avenue and Hancock Street, Long Island City, 38 x 112 ft., for a new plant.

Motors, conveying and other equipment will be installed in the new incinerator plant to be constructed by the Board of Trustees, Sea Cliff, N. Y., for which bids will be received until Feb. 21. R. H. Branthwaite is clerk.

The Certain-teed Products Corporation, 233 Broadway, New York, is planning for a bond issue of $20,000,000, a portion of the proceeds to be used for the purchase of additional plants and properties. The company specializes in the manufacture of roofing and similar products. George M. Brown is president.

A manual training department will be installed in the high school to be erected at Fort Edward, N. Y., estimated to cost $90,000, for which an architect will soon be selected.

Fire, Feb. 3, destroyed a portion of the plant of the Armour Fertilizer Co., 209 West Jackson Boulevard, Chicago, at Roosevelt, N. J., with loss estimated at $75,000, including machinery. The structure was two-story, 150 x 300 ft. It is planned to rebuild.

The Electrical Alloy Co., Ridgedale Avenue, Morristown, N. J., manufacturer of high resistance electric wire, etc., is planning for the installation of a shear for cutting cold steel.

The Barrett Co., 40 Rector Street, New York, manufacturer of roofing products, etc., is taking bids for a one-story plant at Shadyside, near Edgewater, N. J., for the manufacture of car heater apparatus.

Fire, Feb. 6, destroyed the plant of the J. H. Stone Corporation, Berkeley Heights, N. J., manufacturer of cold storage plant insulation products, with loss estimated at $150,000, including machinery. Tentative plans are being considered for rebuilding. An addition to the plant has recently been projected. The company also operates works at Port Colburn, Ont. Frederick H. Leland is superintendent.

D. G. Morse, 57 Hixon Place, South Orange, N. J. has inquiries out for a tempering furnace, rotary type.

A manual training department will be installed in the two-story high school to be erected at Whitehall, N. Y., estimated to cost $100,000. Tooker & Marsh, 101 Park Avenue, New York, are architects.

New England

BOSTON, Feb. 12.

MACHINE tool buying still is confined largely to new equipment, usually for one or two tools, and in most instances is a matter of private negotiation, and not open to competition. In some cases price concessions are made notwithstanding recently published lists issued by machine tool makers showing advances in quotations or reduced discounts. In the aggregate the volume runs below that for normal pre-war years. There is, however, a tendency toward business expansion, but it is slow.

The most important sale the past week was a 36-44-in. side head mill, a 14-in. lathe and reversing motor drive equipment for a large planer to the Maine Central Railroad. The New England Power Co. bought a 60-ton Whiting crane. Lathes, mostly new, are selling in greater proportion than other tools. A 42-in. x 18-ft. Lodge & Shipley to the Morgan Construction Co., Worcester, and two 14-in. x 6-ft. Flather to the American Woolen Co., Boston, are perhaps the most important lathe sales. One textile interest bought a used No. 3-B plain milling machine and a horizontal boring mill, and another textile interest a new milling machine of the same type. Screw machines are well to the front in recent transactions, both new and used.

A local dealer bought considerable Government owned equipment used during the war by a Massachusetts car builder, details of which will shortly be made public. Small tools and machine parts are selling well, but not in the volume noted the latter part of 1922. Drills are the most active tools on the list. Yale & Towne screw geared hoists are quoted at 30 per cent discount, contrasted with 33 1-3 per cent heretofore.

The Uxbridge Worsted Co., Uxbridge, Mass., has awarded contract to George P. Carver, Inc., 261 Franklin Street, Boston, for a power plant.

The Dairy Machinery & Construction Co., Derby, Conn., is included in the merger of the Creamery Package Co., Chicago, and the Davis-Watkins Dairymen's Mfg. Co., effective Feb. 15. Present plans call for expansion at Derby. Crandon D. Gates is president of the latter company.

Conveyor and other mechanical equipment will be installed in the five-story warehouse, 50 x 155 ft., to be erected on Summer Street, near Avenue A, Boston, by the Boston Wharf Co., 259 Summer Street, estimated to cost $425,000.

The Boston Sand & Gravel Co., 300 Condor Street, Boston, is planning for the installation of a planer, shaper and tinsmith shears at its machine shop.

A manual training department will be installed in the proposed two-story high school, 36 x 110 ft., to be erected at Mattapoisett, Mass., estimated to cost $90,000. Brown & Poole, 688 Pleasant Street, New Bedford, Mass., are architects.

The Supply Officer, United States Navy Yard, Boston, will take bids at once for 1000 boiler tubes.

The Tubular Woven Fabric Co., Pawtucket Avenue, Pawtucket, R. I., has awarded a contract to O. D. Purrington & Co., Providence, for a one-story and basement addition, 83 x 100 ft., to cost $25,000.

Fire, Feb. 4, destroyed the car barns and shops of the Connecticut Street Railway Co., Meriden, Conn., with loss estimated at $150,000.

The Eastern States Refrigerating Co., 343 Bridge Street, Springfield, Mass., is planning for extensions and improvements in its ice and refrigerating plant on Dwight Street, to cost $190,000, including equipment.

Traveling cranes and other equipment will be installed in the freight terminal to be erected by the Portland Terminal Co., Portland, Me., to cost about $1,500,000. The present capacity will be tripled.

A manual training department will be installed in the proposed high school to be erected at Fairfield, Conn., estimated to cost $160,000, for which bids will soon be called on a general contract. O. C. S. Ziroli, 211 State Street, Bridgeport, Conn., is architect.

August Beckman, Oakland Street, Springfield, Mass., will erect a one-story machine shop to cost about $16,000.

A manual training department will be installed in the high school to be erected at Gorham, N. H., estimated to cost $150,000, for which it is planned to select an architect at an early date.

The American Metal Hose Co., 67 Jewelry Street, Waterbury, Conn., plans the erection of a three-story addition, 60 x 100 ft., to cost approximately $125,000, including equipment.

The Standard Electric Time Co., 89 Logan Street, Springfield, Mass., manufacturer of electric clocks, will take bids at once for three new units, each 22 x 50 ft. Harry L. Sprague, 310 Main Street, is architect.

A vocational department will be included in the new $225,000 Guiteras Memorial high school to be erected in Bristol, R. I. Clarke & Howe, 1208 Turks Head Building, Providence, are the architects and engineers.

Philadelphia

PHILADELPHIA, Feb. 12.

MOTORS, conveying machinery and other equipment will be installed at the plant of the Universal Publishing Syndicate, 1512-20 North Thirteenth Street, Philadelphia, to double the present capacity. C. W. Carroll is president.

The Quaker City Rubber Co., 624 Market Street, Philadelphia, manufacturer of mechanical rubber products, has

completed plans for a new two-story and basement building, 31 x 70 ft.

L. F. Seyfert's Sons, Inc., 437 North Third Street, Philadelphia, machinery dealer, has inquiries out for a motor-driven air compressor, capacity from 2200 to 3000 cu. ft.

The American Steel Co., York and American Streets, Philadelphia, is said to be arranging a list of equipment for installation in a new fabricating shop, including hammers, drilling machines, punches, etc.

The Foreign Trade Bureau, Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Popayan, Colombia, which is in the market for machinery to manufacture mechanical equipment, also water-power machinery, motors and parts, electrical apparatus and pumping machinery; and from a company at Durban, South Africa, for water-pumping engines and auxiliary equipment.

The Board of Public Education, Ludlow Street, Philadelphia, has plans for the erection of a three-story mechanical shop, 100 x 100 ft., at Front and New Streets.

The Atlantic Refining Co., 3144 Passyunk Avenue, Philadelphia, will soon commence the construction of a new oil refinery at Port Arthur, Tex., on a 500-acre tract recently acquired. It will cost in excess of $500,000.

The Foley Steel Co., Harrison Building, Philadelphia, has inquiries out for a rotary shear.

H. C. Bebbington & Co., Inc., 221 East Hanover Street, Trenton, N. J., engineers, has acquired about a half acre on Pennington Avenue, as a site for a machine and mechanical works.

The United States Engineer Office, 815 Witherspoon Building, Philadelphia, will take bids until Feb. 23 for one Diesel engine, complete with accessories and spare parts, and one screw propeller.

The Morganthau Electric Co., 204-6 Market Street, Harrisburg, Pa., manufacturer of motors, fans, etc., is said to be planning the erection of a two-story factory, 80 x 110 ft., to cost $90,000, including equipment. R. B. Thompson and L. A. Gable head the company.

The Gulf Refining Co., Frick Annex, Pittsburgh, is planning for a two-story machine shop and general operating works, 40 x 130 ft., at Reading, Pa.

Fire, Feb. 8, destroyed a portion of the plant of the York Haven Paper Co., York Haven, Pa., with loss estimated at $50,000, including equipment. It is planned to rebuild.

E. B. Hauenstein, Lincoln, Pa., has inquiries out for machinery for the manufacture of paper boxes and containers.

The B. M. Root Co., 30-38 Jefferson Avenue, York, Pa., manufacturer of machinery and parts, has plans under way for a one-story addition.

A manual training department will be installed in the high school to be erected at Pottstown, Pa., estimated to cost $300,000, for which bids will be received on a general contract until Feb. 27. Ritter & Shay, North American Building, Philadelphia, are architects.

Fire, Feb. 6, destroyed the coal breaker at the No. 7 colliery of the Susquehanna Collieries Co., Nanticoke, Pa., with loss estimated at $700,000, including machinery. It is planned to rebuild. Headquarters of the company are in the Commercial Trust Building, Philadelphia.

Stanley G. Flagg & Co., 1421 Chestnut Street, Philadelphia, iron and steel products, have commenced the erection of a one-story addition to their machine shop at Stowe, Pa., 60 x 150 ft.

G. M. Jones, 916 North Washington Avenue, Scranton, Pa., operating an electrical repair plant, is planning for the installation of a milling machine, welding apparatus and other equipment.

The Binney & Smith Co., 41 East Forty-second Street, New York, is taking bids for a new power house at its lamp black manufacturing works at Keplers, Pa. Lockwood, Greene & Co., 101 Park Avenue, New York, are architects and engineers.

A large machine and repair shop will be installed by the City Garage Co., Allentown, Pa., recently organized, at South Seventh and Walnut Streets, formerly three-story plant of the Neuweiler Brewery Co. The machine department will be in charge of R. W. Frey and A. J. Frankenfield, who with William B. Bergey, head the new company.

The Lycoming-Edison Co., Willow and West Streets, Williamsport, Pa., will commence enlargements in its local electric generating plant, to include the installation of additional equipment.

The Sinclair Oil Co., 45 Nassau Street, New York, is arranging an appropriation of about $4,000,000 for the construction of its refinery and distributing plant near Marcus Hook, Pa. Work on the initial building, two-stories, 80 x 120 ft., has commenced.

Baltimore

BALTIMORE, FEB. 12.

THE Susquehanna Power Co., Elkton, Md., is perfecting plans for a new hydroelectric generating plant near Conowingo, on the Susquehanna River, to cost $500,000.

The C. D. Prudden Corporation, Warner Street, Baltimore, manufacturer of sectional steel buildings, has filed plans for a new building, 48 x 80 ft.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Feb. 27 for one annealing furnace for the Portsmouth, N. H., navy yard, schedule 494; until Feb. 20 for 4872 dozen hacksaw blades for the Boston Navy Yard, schedule 496; and 11,200 sq. ft. of copper wire cloth for the Hampton Roads Navy Yard, schedule 513; until March 6 for steel wire rope for Eastern and Western yards, schedule 492.

The Baltimore Ship Repair Co., Inc., Baltimore, has acquired property at Covington and Montgomery Streets, for a new plant.

The J. T. Rice Co., LaGrange, Ga., has acquired property at Cedartown, Ga., for the establishment of a branch plant. It manufactures iron castings, parts, etc.

The North Carolina Iron & Mining Co., Andrews, N. C., recently organized, will install a mechanical washing and crushing plant, steam shovel and other equipment in connection with a proposed iron ore plant near Murphy, N. C. D. F. McLaffery is president and general manager.

The Chief of Air Service, United States Army, Washington, will purchase in the open market 2000 sleeves, union, compression, ⅛ in. tube; and 2000 nuts, union, compression, ⅛ in. tube.

The General Purchasing Officer, Panama Canal, Washington, will take bids until Feb. 20 for two duplex pumps, 1,000 ft. plow steel rope, nipples, unions, bushings, couplings, tees, check valves, ejectors storage batteries and other equipment for the canal zone as set forth in circular 2312.

The Wilmington Fibre Specialty Co., New Castle, Del., has acquired the fibre works of the Johns-Manville Co., Lockport, N. Y., and will remove the machinery to its local plant. Other equipment will be installed in connection with enlargements, including automatic screw machines, fibre-making machines, rolling machines, etc. The expansion is estimated to cost $185,000. John W. Morris is president.

Charls L. Rhode & Sons, Inc., foot of Third Street, Baltimore, is planning to immediately rebuild the portion of its shipbuilding and repair plant recently destroyed by fire. Additional equipment will be installed.

The American Alloys Co., American Building, Baltimore, operating a foundry at Curtis Bay, is planning for the installation of a cupola.

The Purchasing Clerk, Bureau of Engraving and Printing, Washington, will receive bids until Feb. 17 for 58 standard adjustable varying speed motor attachments, 5 hp., 220 volts.

The North Carolina Granite Corporation, Mt. Airy, N. C., is in the market for a steam-electric generator set, about 100 kw. capacity.

The Tidewater Power Co., Wilmington, N. C., will make extensions in its power plant and system, including the installation of electric substations and 68-mile transmission line, to cost $130,000.

The Greenwood Ice Co., Greenwood, N. C., is planning for the installation of new ice-manufacturing equipment, to replace the machinery destroyed by fire Feb. 5.

T. H. Coker, Hartsville, S. C., is planning for the equipment of a local clay-grinding plant. Inquiries are being made for grinding, screening, washing and kindred equipment.

A manual training department will be installed in the new high school to be erected at Spindale, N. C., estimated to cost $100,000. M. K. Boyer, Charlotte, N. C., is architect.

A power house, ice-manufacturing and cold storage plant will be built by the W. B. Warthen Produce Co., Davisboro, Ga., in connection with additions to its plant.

The Spottsylvania Power Co., Fredericksburg, Va., has plans for the installation of a new oil-burning electric power house, using Diesel engines, for auxiliary service in connection with its hydroelectric power station. Alvin T. Embrey is president.

The Hickory Chair Mfg. Co., Hickory, N. C., will take bids at once for a new one-story plant, 75 x 255 ft., to cost $45,000. Most of the machinery will be motor-driven. Q. E. Herman is architect. George Bailey is general manager.

Cleveland

CLEVELAND, Feb. 12

THE volume of machine tool business continues good. While buying is confined largely to single machines or one or two tools, some large orders have been placed and others are pending. The automotive industry continues to lead in the buying. The Ford Motor Co. has placed a round lot of multiple spindle high-speed drilling machines, with a total of 150 spindles. The Continental Motors Co. is buying drilling and special milling machines for its Muskegon, Mich., plant. The Crane Co., Chicago, has purchased from a Cleveland manufacturer 21 small turret lathes for working in brass. A good volume of small orders is also coming from other brass working shops. The Owens Bottle Co., Toledo, has purchased two 14-in. Pratt & Whitney surface grinders and the Buckeye Traction Ditcher Co. a side head boring machine. A Texas oil refining company has an inquiry out for 7 machines for maintenance equipment.

The demand for high grade used machinery has become very active and is attributed to the rather general price advances recently on new tools.

The Steel Products Engineering Co., Springfield, Ohio, announces a 7½ per cent price advance on its line of Overbeck shapers and the Van Norman Machine Tool Co., Springfield, Mass., has made about a similar advance on milling machines.

The Globe Sherardizing Co., Cleveland, has taken over the Globe Plating Works, local, combining the plating and electro-galvanizing with the sherardizing equipment, and will shortly move to a two-story building at 1259 West Seventy-eighth Street. Both the sherardizing and plating works were formerly a part of the Globe Machine & Stamping Co., but a year ago the latter company decided to concentrate on stamping and separate companies were formed for sherardizing and plating. The officers of the Globe Sherardizing Co. are N. J. Kelly, president; E. Durkin, vice-president, and J. M. Kelly, secretary and treasurer.

The Ford Motor Co. plans to enlarge its Cleveland assembling works and to add additional equipment, involving an expenditure of $250,000. Under the new arrangement it is stated that the entire Ford car and tractor will be assembled in the plant, which will add enameling, upholstering and body shops.

The tentative program for building electric power stations and transmission lines in Ohio involves an expenditure in the next three years of $75,000,000, according to figures prepared by the Ohio Committee on Public Utility Information. Electric construction work planned in Ohio this year involves an expenditure of $40,000,000. It is stated that lack of water for steam condensing purposes in electrical generating stations in the central part of the State is responsible for plans for interconnections, which will eventually link together most of the larger power plants into a super-power zone system.

The Forest City Foundry & Mfg. Co., Cleveland, is having plans prepared for new works, 120 x 300 ft., on the site it recently purchased.

The Falcon Steel Co., Niles, Ohio, will erect an addition to its galvanizing department.

The Colson Co., Elyria, Ohio, is planning an extension to its factory.

The Toledo Coldmaker Co., Toledo, Ohio, has been reorganized by a new company, in which many of the former stockholders are interested, and has purchased the plant from the receiver. The company manufactures commercial refrigerating machines and has a capital stock of $100,000. The officers are A. J. Smith, president; E. L. Briggs, vice-president; William F. Miller, secretary, and Henry Neiman, treasurer.

The National Sulphur Co. is planning extensions that will amount to $75,000 to its plant at Bettes Corners, Akron, Ohio. In addition to the new buildings, a 72,000 gal. oil tank will be erected.

The National Grinder Co., Cleveland, has been incorporated with a capital stock of $10,000 by Paul H. Milde, 1132 Forest Road, Julius P. Schweitzer and others, to manufacture cylinder grinders.

The Universal Machine & Tool Co., Canton, Ohio, has been incorporated with a capital stock of $250,000 to take over an existing company of the same name.

It is reported that the Union Tank Car Co. will shortly begin the erection of a new plan in Lima, Ohio.

The Ross Clay Products Co., Dover, Ohio, will erect a new plant.

The American Phonograph Co., Elyria, Ohio, will erect a $10,000 addition. It recently purchased the business of the International Insulating Corporation, Springfield, Mass., which will be removed to Elyria.

Pittsburgh

PITTSBURGH, Feb. 12.

A FAIRLY active market still exists in machine tools, although new inquiries are somewhat fewer than last month. This decline occasions no uneasiness, but is looked upon merely as the reaction from a period of extreme activity in that direction. Buyers are considering the quotations made against their inquiries and it is expected that before the month is out a good many orders will be placed.

The Westinghouse Electric & Mfg. Co. is closing steadily against lists containing more than 100 items for its local and Eastern plants. The Gulbert Steel Co., Pittsburgh, has closed for some of the steel fabricating machinery, but still is to let its machine shop requirements. Another source of business is the McClintic-Marshall Co. for its new bolt and rivet plant at McKees Rocks, Pa. The Duquesne Light Co. has not yet acted on its tool inquiry and the requirements of the Pennsylvania Railroad for its Conway shops, Freedom, Pa., seem to have been shelved for the present. Dealers have had a good week and have disposed of a good many pipe machines, wood-working machines, millers and nail machines.

Pending business in cranes and steel mill equipment is the heaviest since the war. Among daily requests for quotations for estimating purposes was one asking prices on 56 cranes. Actual sales include one 15-ton 72-ft. span crane and one 10-ton double trolley crane for the Dravo Contracting Co., Pittsburgh, by the Shaw Crane Works and a 5-ton 29 ft. span crane, placed by Ajax Iron Works, Corry, Pa., with the Northern Engineering Works. Builders of steel plant equipment have submitted a large number of bids against projected installations running in heavy monetary totals, but on most of the business appropriations have not yet been given.

The American Sheet & Tin Plate Co. has bought a manipulator for a 34-in. blooming mill at its Vandergrift, Pa., works, from the Mackintosh-Hemphill Co. The Carnegie Steel Co. has asked for an appropriation of $17,000,000 for improvements, involving new equipment, for its Monongahela River plants, and is taking prices on equipment preparatory to seeking an appropriation for betterments at its Youngstown plants. Independent steel companies are active in the same direction and it is apparent that there is full realization of the fact that operating costs cannot be reduced except by the installation of modern machinery to minimize the shortage of labor. In this connection, it is noted that there is a very brisk demand for lifting magnets, which usually are wanted only during periods of labor shortages. Power equipment in general is moving well. In addition to the large export order recently taken by the Westinghouse Electric & Mfg. Co. is an order recently placed with the Reliance Electric & Mfg. Co. for 69 machine tool motors by the National Tube Co., which placed the control equipment with the Cutler-Hammer Co.

The Sprague Electric Co. is in the market for a 5-ton, 3-motor, 70-ft. span standard crane for its New Kensington, Pa., works.

A new one-story power house, 45 x 60 ft., will be erected by the Penn-American Refining Co., Oil City, Pa., estimated to cost $90,000. The Rust Engineering Co., 311 Ross Street, Pittsburgh, is engineer.

The Shall Mfg. & Machine Co., 69 Twentieth Street, Wheeling, W. Va., is planning the erection of a two-story addition to its machine shop, 25 x 65 ft., to cost $20,000 with equipment. John M. Harding is head.

The Mountain State Coal & Gas Syndicate, Huntington, W. Va., recently organized with a capital of $2,000,000 to take over and operate the coal properties of the Mud River Coal Co., and the Stevenson Coal Co., is planning for the installation of electrical and mechanical equipment at the plants. Thomas W. Jones, Middleport, Ohio, is president.

The Carnegie Steel Co., Pittsburgh, has plans for the construction of an addition to the power plant at its New Castle, Pa., works, and for improvements in the present power house, to cost more than $150,000.

A manual training department will be installed in the two-story and basement high school to be erected at Indiana, Pa., estimated to cost $350,000. Thayer & Johnson, 39 North Jefferson Street, New Castle, Pa., are architects.

The Erie Foundry Co., Twelfth near Cranberry Street, Erie, Pa., will take bids before the end of this month for a new two-story and basement building, 35 x 70 ft., to cost $20,000. The Osborn Co., 2848 Prospect Avenue, Cleveland, is architect.

The Canonsburg Steel & Iron Co., Canonsburg, Pa., will commence the erection of a two-story addition, 80 x 200 ft., to cost about $35,000.

E. G. House, Indiana, Pa., operating at the former properties of the Manufacturers' Coal Co., in the Yellow Creek District, is planning for the installation of additional electrical and mechanical equipment.

The Libbey-Owens Sheet Glass Co., Nicholas Building, Toledo, Ohio, has awarded contract to the American Bridge Co., Pittsburgh, for an addition to its plant at Charleston, W. Va., to cost more than $250,000, with machinery.

The Duquesne Light Co., 435 Sixth Street, Pittsburgh, will purchase 10 electric light and power companies in Robinson, Neville, Stowe, Haysville and adjoining townships and consolidate the properties. Extensions will be made in the plants and systems.

The American Metallic Packing Co., North Side, Pittsburgh, is planning for the installation of a number of machine tools.

Milwaukee

MILWAUKEE, Feb. 12.

MACHINE-TOOL trade still is spotty, but volume of sales is increasing. The automotive industries are the most active source of demand, but so far this year it evidently has been largely of a replacement character. Local tool builders find less difficulty in maintaining production schedules on an even scale and most shops are adding a few men each week, although working forces are still considerably below normal. Several new metal-working enterprises are being launched and in many instances will provide good outlets for used machinery, which is still in plentiful supply, but not so keenly competitive against new machinery.

Milwaukee and Manitowoc capital, in association with interests identified with the Newaygo Portland Cement Co., Newaygo, Mich., are organizing a new corporation under the laws of Wisconsin, with $1,000,000 capital, and contemplates erecting a plant in Manitowoc for manufacturing cement by the wet process. Options have been taken on a site in the inner harbor.

The Burdick Cabinet Co., Chicago, is installing machinery in an addition at its main works in Milton, Wis., which increases the floor area to more than 50,000 sq. ft. It will accommodate machine shop, plating and enameling departments, physical and clinical research laboratories, and shipping room. The company manufactures electric cabinets and other hospital equipment.

The Gilson Mfg. Co., Port Washington, Wis., sustained an estimated loss of $45,000 by fire on Feb. 3, which gutted the boiler house and main warehouse. Other departments were only slightly damaged. A new japanning building, boiler house and warehouse will be erected at once. Harry W. Bolens is president and general manager.

The Belle Marie Mining & Milling Co., Aspen, Colo., has engaged A. J. Petelinz, architect, 426 Grand Avenue, Milwaukee, to design a new group of mining, power house and mill buildings to be erected in the spring at a cost of $275,000. Details have not yet been given out.

The Miller Spouting Co., West Bend, Wis., established three years ago to manufacture patented flexible metal couplings and grain spouting, is installing new equipment for the production of aluminum specialties, principally hubcaps for automobiles.

The Associated Manufacturers Co., Inc., 60-64 Second Street, Milwaukee, has acquired one of the three units of the Milwaukee plant of the H. W. Johns-Manville Mfg. Co. at 50-58 Third Street, which is being abandoned with the completion of the new Johns-Manville plant in Waukegan, Ill. The unit is 100 x 150 ft., four stories, and will be used as a factory and warehouse. The Associated company manufactures sanitary products, school, office, factory, institution and janitors' supplies. J. Frederick Palmer is president and general manager.

The Oshkosh, Wis., Iron & Metal Co. sustained considerable damage to its foundry on Feb. 7. The brass and bronze casting facilities were damaged most, although some replacements will be necessary in the gray iron shop. Nathan Levine is owner of the business.

The Prentiss-Wabers Mfg. Co., Wisconsin Rapids, Wis., making stoves and ranges and specializing in kitchen outfits for campers, will build an addition estimated to cost $35,000 with equipment. Work is expected to begin about April 1. T. A. Taylor is vice-president and general manager.

Misericordia Hospital, 2224 Chestnut Street, Milwaukee, has engaged Backes & Pfaller, architects and engineers, 217 West Water Street, local, to design a five-story hospital addition; a boiler house and power plant, 45 x 100 ft., and other buildings. New boilers, engine, generators, ice machine and other equipment will be required. The cost of the work is estimated at $165,000.

The Wiese Laboratory Furniture Co., Manitowoc, Wis., manufacturer of steel and wood and combination fixtures, appliances, etc., is contemplating the erection of another addition. F. H. Wiese is president and general manager.

Chicago

CHICAGO, Feb. 12.

ALTHOUGH there are numerous inquiries in the market, buyers are slow to place orders and current business booked by local machine tool dealers is therefore light. The most encouraging aspect is the broadening of demand from general sources. A great diversity of shops is represented in the business now pending. In most cases inquiries are for one or two machines, although larger individual purchases are expected as the construction of various factories and additions in this district progresses. The Sullivan Machinery Co., Chicago, is in the market for equipment for its new plant at Michigan City. One of the largest orders recently placed was by the Gilson Mfg. Co., Port Washington, Wis., for equipment to replace machinery destroyed by fire and covered seven 20-in. drill presses, three 4-spindle gang drills, two 6-in. hack saws, one high speed ball bearing drilling machine, one 16-in. shaper, one 16-in. x 8-ft. engine lathe, one 14-in. x 6-ft. engine lathe, and one No. 2 universal milling machine. Manufacturers of band instruments in this district are unusually active and have purchased a number of machine tools.

The price situation remains unchanged, but a number of lines of shapers will advance approximately 20 per cent, effective March 1.

The Yellow Sleeve Valve Engine Works, Inc., has been formed by John Hertz of the Yellow Cab Mfg. Co., Chicago, for the production of sleeve valve engines for bus work, and has purchased the equipment and machinery for the manufacture of engines of the R. & V. Motor Co., East Moline, Ill. Officers are J. A. Ritchie, president; G. H. Green, vice-president and general manager; and I. B. Babcock, secretary and treasurer. The new company will continue to manufacture automobile engines for the R. & V. Motor Co.

The Cushman Machine Works, Fort Madison, Iowa, recently incorporated with $10,000 capital stock, has leased a plant for general machine shop work. Equipment has been arranged for with the exception of a piston grinding machine, for which the company is now inquiring. Officers are W. A. Sherfe, president; E. T. Cushman, vice-president and general manager; W. F. Boekenkamp, secretary and treasurer.

The Knickerbocker Mfg. Co., 2335 West Van Buren Street, Chicago, recently incorporated with $50,000 capital stock, will manufacture shower bath sprays. A two-story brick plant, 80 x 125 ft., has been rented at the address given, and the company's initial equipment has been arranged for. Officers are A. W. Kimbell, president, and J. J. Steffen, secretary.

R. R. Donnelly & Sons Co., Chicago, is having plans prepared for a one-story printing plant, 150 x 300 ft., at Crawfordville, Ind.

Geib & Schaefer, manufacturers of musical instrument cases, 1751 North Central Park Avenue, Chicago, are receiving bids through an architect on a three-story extension, 85 x 165 ft., to cost $200,000.

The Valley City Machine Works, the Grand Rapids Grinding Machine Co., and the Union Machine Co., Grand Rapids, Mich., have consolidated as the Gallmeyer & Livingston Co., with a capital stock of $450,000. The new organization will construct a machine shop on Wealthy Street, West, and will employ 300 men, the present payroll of the three companies

totaling about 150. The new shop will be constructed on a site adjoining the foundry of the Valley City Machine Works. Officers are Christian Gallmeyer, president; S. Owen Livingston, first vice-president; William H. Gallmeyer, second vice-president; B. C. Saunders, secretary, and Charles H. Gallmeyer, treasurer.

William Gilbert, Ada, Okla., will build a machine shop and foundry at Rawlins, Wyo.

The Dudlo Mfg. Co., Fort Wayne, Ind., will erect a new plant at a cost of $50,000 to manufacture a heavier gage wire than it has heretofore made.

The Studebaker Corporation, South Bend, Ind., has started the construction of a new foundry, 650 x 720 ft., with a capacity for castings for 750 automobiles a day. Heretofore the company has purchased part of its castings from outside sources.

The American Steel Foundries, Chicago, has secured a permit for the erection of an addition to its Simplex plant at Hammond, Ind. It will be 240 x 330 ft., and cost $30,000.

The Bastian-Morley Co., manufacturer of water heaters, LaPorte, Ind., has purchased the plant of the Althoff Stove Works on Truesdell Avenue. The former Tyler Street plant of the company passes into the posession of the Althoff Company. The exchange enables the Bastian-Morley Co. to center its activities in one location, its foundry being across the street from its new acquisition.

The Public Service Co. of Northern Illinois has awarded the general contract for the first unit of a power plant at Waukegan, Ill., to the Bates Rogers Co. It will cost $450,000.

The Western Instrument Co., 1001 West Washington Boulevard, Chicago, has acquired a factory on Jefferson Street, 12 ft. south of Monroe Street.

The Stillwater Specialty Co., Stillwater, Minn., recently incorporated, has opened a factory on North Main Street to manufacture spindle bolts for automobiles. Officers are R. J. Coffeen, president; O. L. Newman, vice-president, and Clarence Newman, secretary and treasurer.

The Producers' & Refiners' Corporation, California Building, Denver, Colo., has plans for a new refinery at Greenville, Wyo., to include the construction of a new pipe line, estimated to cost $3,000,000. A stock issue of $7,500,000 is being sold, the construction fund to be taken from the proceeds.

Fire, Jan. 30, destroyed a portion of the locomotive and car shops of the Chicago, Rock Island & Pacific Railroad Co., Valley Junction, Iowa, with loss exceeding $150,000, including equipment. Plans are being projected for early rebuilding.

The Holland Furnace Co., Holland, Mich., is considering plans for an addition to its branch plant at Cedar Rapids, Iowa., estimated to cost $35,000. Walter G. Probost is local manager.

Black Brothers, Beatrice, Neb., are perfecting arrangements for a new hydroelectric generating plant at Blue Springs, estimated to cost $100,000.

The Central Illinois Light Co., East Peoria, Ill., has plans in preparation for a new three-story electric power plant, 90 x 160 ft., estimated to cost $2,500,000 with machinery. R. S. Wallace is general manager.

The Oliver Iron Mining Co., Duluth, Minn., will soon call for bids for a new screening and crushing plant at its Hull Rust Mining properties, Hibbing, Minn., 90 x 110 ft., to cost in excess of $500,000, including machinery. F. R. Mott is general superintendent.

A manual training department will be installed in the new high school to be erected at Wapello, Iowa, estimated to cost $150,000, for which bids will be received on a general contract early in March. Keffer & Jones, Des Moines, Iowa, are architects.

A manual training department will be installed in the high school to be erected at Evanston, Ill., for which bonds for $500,000 have just been sold.

A manual training department will be installed in the new three-story high school to be erected at State Center, Iowa, estimated to cost $100,000, for which bids will be received on a general contract until Feb. 26. H. E. Reimer, Marshalltown, Iowa, is architect.

The Illinois Central Railroad Co., 135 East Eleventh Place, Chicago, will commence the construction of a new power house and gravel-washing plant at Forreston, Ill., to cost $200,000, with machinery.

A new two-story power plant, 50 x 180 ft., will be erected by the South Side Laundry Co., 2820 South Wabash Avenue, Chicago, estimated to cost $70,000. Ronnenberg, Pierce & Hauber, 10 South La Salle Street, are architects.

A vocational department will be installed in the new high school to be erected at Salem, S. D., estimated to cost $160,000. Hughill & Blatherwick, Boyce-Greeley Building, Sioux Falls, are architects.

Indiana

INDIANAPOLIS, FEB. 12.

THE American Can Co., Indianapolis, has leased the building at South Meridan Street and the Belt Railway, formerly occupied by the Spacke Machine Co., for extensions.

The Western Cabinet Co., Batesville, Ind., is considering plans for an addition, to cost approximately $40,000. H .C. Canfield is president.

Fire, Feb. 8, destroyed a portion of the plant of the National Hame & Chain Co., New Albany Ind., including chain works, machine shop and power house, with loss estimated at $150,000, including machinery. It is planned to rebuild. George D. Todd is president and general manager.

The City Council, Mishawaka, Ind., will take bids until Feb. 19 for a motor-driven centrifugal pump, to be used in connection with a new reservoir at the municipal waterworks. The Burns & McDonnell Engineering Co., 402 Interstate Building, Kansas City, Mo., is engineer.

Fire, Feb. 6, destroyed the car barns and shops of the Chicago, South Bend & Northern Railway Co., South Bend, Ind., with loss estimated at $50,000.

The Board of Public Works, Laporte, Ind., will take bids until Feb. 27, for an oil engine pumping unit with capacity of 2,450 gal. per min., for use at the municipal waterworks. J. H. Harding is waterworks superintendent.

The Southern Indiana Gas & Electric Co., Evansville, is planning for extensions and improvements in its power plant and system. A portion of a bond issue of $1,000,000, now being sold will be used for the expansion. B. C. Cobb is president.

Fire, Feb. 5, destroyed a portion of the plant of the Brazil Machine & Foundry Co., Brazil, Ind., specializing in the manufacture of clay-working machinery, with loss approximating $30,000. It is planned to rebuild.

The Milner Mfg. Co., Indianapolis, manufacturer of sheet metal products, has arranged for the establishment of a new plant at 715 South Delaware Street.

E. A. Smith, Indianapolis, has acquired the local plant and business of the West Side Sheet Metal Co., for the establishment of new works. Extensions and improvements are planned.

Detroit

DETROIT, FEB. 12.

THE National Plate Glass Co., General Motors Building, Detroit, a subsidiary of the Fisher Body Corporation, is planning the erection of an addition to its plant at Ottawa, Ill., operated in the name of the Federal Plate Glass Co. About 200 acres adjoining the present plant have been purchased and a complete unit will be installed, to include a machine shop, power plant and other buildings. It is estimated to cost $5,000,000 including machinery. W. A. Fisher is secretary.

The Detroit Machine Tool & Gear Co., Hillger Avenue, Detroit, is planning for the installation of additional equipment.

The Weis Mfg. Co., Monroe, Mich., manufacturer of filing equipment has tentative plans for an addition. The company has recently increased its capital to $1,000,000 for expansion.

The Ford Motor Co., Highland Park, Mich., has awarded contract to the American Bridge Co., Detroit, for a new plant at River Rouge, Mich., for cement manufacture. It is estimated to cost more than $500,000, including machinery.

The Unique Brass Mfg. Co., 123 Military Avenue, Detroit, is planning to rebuild the portion of its plant destroyed by fire Feb. 5, including the replacement of damaged equipment.

A manual training department will be installed in the new school to be erected at Strathmoor, Mich., two-stories, 120 x 135 ft., estimated to cost $200,000. Verner, Wilhelm & Molby, 602 Book Building, Detroit, are architects.

The Inland Mfg. Co., General Motors Building, Detroit, a subsidiary of the General Motors Corporation, is arranging for the establishment of a plant at Dayton, Ohio, to manufacture steering wheels and other automobile equipment. The new works will supplement the present Dayton-Wright plant, which is being utilized for a similar purpose.

The Blakely Mfg. Co., 5675 Wabash Avenue, Detroit, has removed its plant to Fullerton Avenue, where 12,000 sq. ft. of space will be provided. It specializes in the manufacture of steel fastenings for holding motor cars when being shipped by freight, and will install considerable additional equipment for larger production and for new lines of manufacture.

The General Motors Corporation has announced an expansion program for the Chevrolet plant at Bay City, Mich., with an approximate expenditure of $250,000 on alterations and equipment.

The Great Lakes Power Co., Bad Axe, Mich., has applied for a franchise authorizing the erection of 175 miles of power lines along State roads at a cost of $500,000, the power to be delivered from the Marysville plant of the Detroit Edison Co.

The Manistique Brass & Bronze Co., Manistique, Mich., which began operations a few months ago, has announced that it will erect an addition to its plant.

The Oakland Foundry & Machine Co., Rochester, Mich., has been incorporated with a capital of $25,000 to manufacture gray iron, brass and aluminum castings. It will operate the plant formerly occupied by the Rochester Foundry Co. Organizers of the new company are: Edward F. Striker, Detroit; Will Becht, Rochester; Henry Albright and B. A. Joyce, Kokomo, Ind.

The Reo Motor Car Co., Lansing, Mich., will begin, in the early spring, the erection of a new storage and shipping building to cost approximately $500,000 and to have 640,000 sq. ft. of floor space. It will be three stories, 577 x 365 ft. and will provide storage space for 3,000 vehicles. The train shed will accommodate 72 freight cars.

The Central South

ST. LOUIS, FEB. 12.

THE United States Motor Bus Transit Co., 911 Title Guarantee Building, St. Louis, manufacturer of motor buses, will commence the erection of two two-story buildings, 200 x 200 ft., and 150 x 200 ft., on the Grand Boulevard. The first will be equipped as a machine shop, assembling department, etc., and the second will be used for general operating service. It will cost $225,000.

The Hayes Equipment Co., 701 East Gilbert Street, Wichita, Kan., manufacturer of gasoline pumps and parts, has awarded contract to Vandenberg & Son, Inc., 119½ South Lawrence Street, for a one-story and basement addition, 80 x 230 ft.

S. C. Walker, Smith Center, Kan., will soon take bids for a three-story and basement ice and cold storage plant to cost $45,000. W. E. Glover, Stormont Building, Topeka, Kan., is architect.

Daniel L. Jones, Muskogee, Okla., and associates, stockholders of the O. K. Truck Co., have taken over the local plant at a forced sale of $62,000. It has been closed for some time past on account of financial difficulties. A new company will be organized. Improvements will be made and equipment provided for a daily output of four complete motor trucks, with service and repair department for cars now in use.

A manual training department will be installed in the two-story and basement high school, 75 x 120 ft., to be erected at Lenora, Kan., estimated to cost $80,000. Smith & English, Nelson Building, Hutchinson, Kan., are architects.

The Poplar Bluff Ice & Fuel Co., 435 South Main Street, Poplar Bluff, Mo., will equip a new ice-manufacturing plant, with capacity of about 100 tons per day. F. A. Bacon is president.

The Grand River Hydro-Electric Power Co., Oklahoma City, Okla., has plans for a hydroelectric generating plant in the vicinity of Ketchum, Okla., estimated to cost $5,000,000, including transmission system. Charles T. Fenstermacher is one of the heads of the company.

The Derby Refining Co., Wichita, Kan., is planning for extensions in its refinery to increase the present capacity of 5000 bbl. per day about one-third. It will cost approximately $300,000 with machinery.

A manual training department will be installed in the high school to be erected at Sabetha, Kan., estimated to cost $100,000. William H. Saylor & Co., 306 Mutual Building, Kansas City, Mo., are architects.

Motors and other equipment will be installed in the new printing plant to be erected on Lamar Avenue, Memphis, Tenn., by the Southern Art Co., 191 Front Street, estimated to cost $80,000. Mahan & Broadwell, American Savings Bank Building, are achitects.

The Union Pacific Railroad Co., Omaha, Neb., has tentative plans for a new engine house and repair shops at Topeka, Kan.

The Comar Oil Co., Tonkawa, Okla., is planning for the erection of a new seven-unit refinery to cost $150,000.

The Dixie Portland Cement Co., Chattanooga, Tenn., is planning for extensions and improvements at its plant to cost $200,000, including the installation of additional equipment.

E. C. Groves, 135 South Minneapolis Avenue, Wichita, Kan., is in the market for wood-working tools and machinery.

A manual training department will be installed in the new high school to be erected at Vandalia, Mo., estimated to cost $85,000, for which bids will be called before the close of the month. Earl Hawkins & Co., Springfield, Mo., are architects.

The Chattanooga Stamping & Enameling Co., Chattanooga, Tenn., will install new electric furnaces and other equipment at its plant at North Chattanooga, to increase the capacity more than 25 per cent. The work will cost about $35,000.

Two centrifugal pumps and two triplex pumping units and other power equipment will be installed in connection with improvements and extensions in the municipal waterworks at Van Buren, Ark., estimated to cost $210,000. W. L. Winters, Fort Smith, Ark., is consulting engineer.

The Gulf States

BIRMINGHAM, FEB. 12.

A ONE-STORY addition, 50 x 100 ft., will be erected at the plant of the Dallas Brass Mfg. Co., 4015 Main Street, Dallas, Tex., to be used for the manufacture of brass and other metal goods, estimated to cost $35,000. J. W. Davis is general manager.

The Missouri, Kansas & Texas Railroad Co., St. Louis, will make extensions in its Bellmead locomotive repair shops near Waco, Tex., to cost about $500,000, including machinery.

The E. Nelson Mfg. Co., 710 Mary Street, Waco, Tex., recently organized, has plans for the erection of two buildings, one- story, 45 x 165 ft., and two stories, 26 x 85 ft., respectively, for the manufacture of sash and doors, etc. It will cost approximately $55,000. E. Nelson is president.

The Texas Utilities Co., Slaton, Tex., will make additions and improvements in the power plant and system of the Slaton Light & Power Co., recently acquired.

The Texas Sugar Refinery Co., Texas City, Tex., recently organized with a capital of $5,500,000, has perfected its organization with Alexander Smith of Peabody, Houghteling & Co., 366 Madison Avenue, New York, bankers, as president. Two blocks of property have been acquired for the initial plant, which will consist of a number of units, with machine shop and power house, and will cost close to $1,000,000, instead of $250,000, as previously announced.

G. L. Jones, Marble Falls, Tex., has plans for the erection of a new electric power plant for local service.

The Birmingham Machine & Foundry Co., Thirty-seventh Street and Tenth Avenue, North, Birmingham, has broken ground for an addition for the manufacture of cast iron pipe. It is estimated to cost $80,000.

George C. Brown & Co., Huntsville, Ala., manufacturer of cedar products, has purchased about 10 acres of land at East Birmingham as a site for a new veneer plant. It will include a machine shop and power house, and is estimated to cost $100,000.

Dudley & Orr, El Paso, Tex., have acquired a rock-crushing plant at Tiffin, Tex. Extensions and improvements will be made, including the installation of additional crushing and power equipment, estimated to cost $75,000.

The Imperial Pipe Foundry, Bessemer, Ala., has plans for extensions to increase the capacity about 50 per cent. A contract for the building work has been let.

The Pickens County Light & Power Co., Aliceville, Ala., recently organized, will soon commence the erection of a new light and power plant. J. V. Park is president, and B. H. Summerville, secretary and treasurer.

A. L. Hacker, Vernon, Tex., has acquired a local brick building, now nearing completion, and will soon commence the installation of a machine shop for the manufacture of machine parts, repairs, etc.

The Texas & Pacific Railroad Co., Dallas, Tex., is perfecting plans for the erection of additions at its locomotive repair plant at El Paso, Tex. An engine house, machine shop and other structures will be built. The company will also enlarge its shops at Toyah, Tex., including the installation of a turntable. E. F. Mitchell is chief engineer.

The City Council, Wichita Falls, Tex., is planning for the installation of a new pumping plant, electrically-operated, for municipal service. It will have an initial capacity of 10,000,000 gal.

Sobel & Rothschild, 824-826 West Bay Street, Jacksonville, Fla., is in the market for a 150 hp. Scotch marine boiler in first class condition; wet back and corrugated furnace preferred, taking not less than 150 lb. steam pressure; also for one 25 hp. locomotive type boiler.

Cincinnati

CINCINNATI, Feb. 12.

ORDERS for machine tools booked during January are sufficient to keep the majority of local plants running at the present rate of operation well into March. While the past week was quiet, compared with similar periods in January, a number of orders were booked, and with action expected on some fair-sized lists, the immediate future looks very promising. One of the largest lists to come out in some time has been issued by the St. Louis-San Francisco Railway, St. Louis, which will take bids until Feb. 19 on tools and general equipment, comprising 88 items.

Little is heard of advancing prices, though such a course is being seriously considered by a number of manufacturers. The general opinion appears to be that while prices generally will be higher, no changes will be made in the immediate future. The Hendee line of shapers has been advanced a flat 20 per cent.

The Missouri, Kansas & Texas is in the market for six tools, including two engine lathes, one planer, one radial drill, one sensitive drill and one large steam hammer. The Chicago, Burlington & Quincy has inquired for three engine lathes and the Michigan Central for two engine lathes. The Louisville & Nashville Railroad has taken bids on four engine lathes, one radial drill, one pipe threading machine, one shaper and one boring mill, and orders are expected to close this week. Action also is looked for on the Big Four list of about one dozen tools. Industrial buying is keeping up in good shape. The Newport Rolling Mill Co. continues to buy from time to time. The Missouri Pacific has placed orders for lathes and drilling machines and is expected to purchase the remainder of the equipment recently inquired for.

One of the largest deals in recent months has just been reported and includes the purchase of about 50 gear hobbing machines by a large gear manufacturer in the Middle West. This order alone, placed the latter part of January, amounts to approximately $100,000.

The list of the St. Louis-San Francisco Railway follows:

Two 2000-lb. single frame steam hammers.
One 3000-lb. single frame steam hammer.
One 2½-in. Acme all steel heading, upsetting and forging machine, complete with counter shaft.
Two Bullard 44-in. Maxi-mills, actual swing 48-in. single pulley drive.
Two 32-in. heavy duty Invincible crank shaper.
Three LeBlond 11-in. heavy duty rapid production lathes, motor driven.
One 90-in. heavy driving wheel lathe complete, with 50-hp. motor, 440 volt, 3 phase, 60 cycle a.c. 7½-hp. motor for operating tail stock.
One Niles heavy duty double head axle lathe, single pulley drive.
Four LeBlond 23-in. x 10-ft. heavy duty single pulley, geared head engine lathes.
Two 30-in. x 14-ft. bed heavy duty single pulley geared head engine lathes.
Two LeBlond 19-in. x 8-ft. single pulley geared head engine lathes, belt drive.
One 36-in. x 36-in. x 10-ft. metal planer, belt drive.
Three 5-ft. American plain radial drills, single pulley.
Four 36-in. Aurora upright drill presses, back geared belt driven.
One Aurora 36-in. vertical upright drill press, back geared, motor driven.
Three Aurora 40-in. upright drill presses, back geared, belt driven.
One Aurora 40-in. vertical drill press, back geared, compound table, motor driven.
One Niles 4-spindle flue sheet and mud ring drill.
One No. 5 single spindle sensitive drill press, belt driven.
Four 100 ton vertical hydraulic bushing presses, complete with crane and chain hoist, belt drive.
Four vertical single end 24-in. open throat power shear, belt driven.
Four single end 24-in. open throat power punches, belt driven.
One Niles No. 2 motor driven bending roll 220 volt, three phase, 60 cycle, a.c. equipped with 10-hp. motor and controller.
One Niles No. 2 bending roll, belt drive.
One 20-in. Jones duplex control slotter, belt drive.
One McCabe pneumatic flanging machine.
Two Matthews flue cutting off machines, belt drive.
Two Hartz flue welding machines, belt drive.
One No. 7 Racine metal cutting machine.
One Landis 20-in. x 96-in. self contained gap grinding machine, with motor for 440 volt, 3 phase, 60 cycle a.c.
Six No. 6 a.c. motor driven grinders, equipped with ball bearings.
Five No. 6 belt driven floor grinders.
Two 2½-in. double bolt cutter class A, belt drive.
Six Acme 2-in. double head bolt cutter class A, belt drive.
One Westinghouse type CS 10-hp. motor, 50 degree rating, 220 volts, three phase, 60 cycle, speed 1160 r.p.m. complete.
One Westinghouse type CS 20-hp. motor, 50 degree rating, 440 volts, three phase 60 cycle, speed 1160 r.p.m.
One Westinghouse type CS 30-hp motor, 50 degree rating, 440 volts, three phase, 60 cycle, speed 870 r.p.m.
Two Westinghouse type CW, 40-hp. motors, (slip ring type) constant speed, 40 degree rating, 440 volts, three phase, 60 cycle, speed 1160 r.p.m.
One Westinghouse type CW, (slip ring type) 75-hp. motor, 220 volts, three phase 60 cycle, speed 870 r.p.m.
One Westinghouse type CW, (slip ring type) 50-hp. 220 volt, three phase, 60 cycle, speed 870 r.p.m.
One Westinghouse type CW, 75-hp. motor, (slip ring type) constant speed, 40 degree rating, 440 volts, three phase, 60 cycle, speed 870 r.p.m.
Three Westinghouse type CW, 50-hp. motors, (slip ring type) constant speed, 40 degree rating, 440 volts, three phase, 60 cycle, speed 870 r.p.m.
One Westinghouse type CW, 75-hp., (slip ring type) 440 volts, three phase, 60 cycle, speed 870 r.p.m.
Two Westinghouse type CW, 50-hp. motors, (slip ring type) 440 volts, three phase, 60 cycle, speed 870 r.p.m.
Three Alternarc electric welding machines.
Four 14/23 x 22/13 x 16 Worthington, Laidlaw type, cross compound, steam driven air compressors.
One 12/20 x 18/11 x 14 Worthington, Laidlaw type, cross compound, steam driven air compressor.
Six 350-hp. horizontal water tube stationary boilers.
Eight 60-in. x 14-ft. vertical air storage reservoirs.
Six horizontal duplex piston boiler feed pressure pattern pumps.
Seven double Blake & Knowles fuel oil pumping system.
Seven Worthington duplex piston oil meters, size 1½ in.
Seven 2-in. Worthington turbine boiler feed hot water meters, complete with strainers.
Fourteen 2-in. Worthington basket pattern strainers.
Three 700-hp. Cochrane boiler feed water heaters and receivers.
One 800-hp. Cochrane boiler feed water heater and receiver.
Six S. C. boiler feed water regulators.
One Hauck portable burner.
One 4-ft. x 20-ft. hearth locomotive main and side rod annealing furnace.
Four forging furnaces with hearth 5-ft. x 7-ft., door opening 36-in. x 18-in. to operate on fuel oil.
Nine No. 94 Buffalo stationary blacksmith forges.
One No. 505 Mahrvel direct connected motor driven blower.
Two No. 505 Mahrvel direct connected motor driven pressure blowers.
One No. 45 Buffalo slow speed high efficiency electric mill exhauster with extra heavy structural steel motor sub-base, complete with motor and controller.
One No. 45 Buffalo slow speed, high efficiency electric mill exhauster, complete with extra heavy structural steel motor sub-base attached to the exhauster housing and direct connected to motor.
One No. 9 Buffalo steel pressure blower.
One No. 3 Canton portable floor crane, capacity 5000 lb.
One No. 1 Canton portable floor crane, capacity 2000 lb.
One No. 214 10-ton capacity pneumatic geared hoist and trolley.
Two Little David 2-ton capacity pneumatic geared hoists.
Two Little David 3-ton capacity pneumatic geared air hoists, double geared type.
Three Greenlee No. 232-HC 2-in. vertical hollow chisel car mortisers.
Two Greenlee No. 456 36-in. automatic cut off machines.
Two Greenlee No. 502-F extra heavy automatic high speed car gaining machines.
Two Greenlee No. 330 five spindle vertical radial car boring machines, belt drive with countershaft; machine to have 14 ft. long power and hand traveling table.
Two Greenlee No. 429 32-in. self feed rip saws.
Two Yates No. 275 30-in. automatic knife grinders.
Two Yates No. 14 heavy duty timber sizer, planer and matchers with flexible connection for motor drive, complete with 75-hp. motor.
One No. 16 Yates timber sizer planer and matcher, belt drive.
Two J. A. Fay & Egan No. 50 band saw machines.
Three No. 142-B hand circular saw sharpener and gummers.
One No. 90 Oliver universal saw bench, belt drive.
One portable grindstone cast iron frame, mounted on four wheels.
Three No. 105-C hand circular saw sets.
Three pairs No. 88 fitting up wheels for scroll band saws.
Three No. 87-A 20-in. steel jawed scroll band saw filing vises.
Three No. 84 narrow band saw brazers.
Three No. 101 Defiance knife balancing machines.

The Bevis & Shartle Machine Co., Middletown, Ohio, has let contract for an addition which will greatly increase its facilities for repair and general machine work. Some new equipment will be installed. Guy Bevis is president.

The Columbus Machine Co., Columbus, Ohio, has been merged with the Reading Valve Co. and the business will be conducted in future under the name of the former company. The firm manufactures hydraulic steel valves, and makes a specialty of a steel drilling valve for oil field work. The erection of a new plant is contemplated at Mount Vernon Avenue and Burr Street. J. F. Horton is president.

Fire Feb. 8 at the plant of the National Hame & Chain

Co., New Albany, Ind., destroyed the machine shop, power house, stock room and office building, causing a loss of approximately $150,000.

The W. E. Lamneck Co., Columbus, Ohio, manufacturer of furnace fittings, has recently moved into its new plant, formerly occupied by the Allen Motor Car Co. It has installed additional machinery and is equipped to double its former capacity. W. E. Lamneck is president.

The Stiegelmeyer Mfg. Co., Seymour, Ind., organized for the manufacture of an automatic train control device, will erect a new plant at Seymour, which will include a foundry and machine shop. Edward Stiegelmeyer, 1446 Prospect Street, Indianapolis, is secretary-treasurer.

Buffalo

THE Peerless Husker Co., 523 Cornwall Avenue, Buffalo, manufacturer of canning machinery, is planning the erection of an addition, 82 x 86 ft. Franklin G. Slagel is engineer.

The Blandford Paper Box Co., Lockport, N. Y., recently organized, has leased a local building and will install machinery, including power equipment, for the manufacture of paper boxes and containers. Herbert Blandford and Robert V. Scott head the company.

A manual training department will be installed in the new high school to be erected at Bath, N. Y., two stories, 140 x 190 ft., to cost $225,000, for which bids will be called on a general contract this month. Tooker & Marsh, 101 Park Avenue, New York, are architects.

Motors, controllers and other equipment will be installed in the three-story printing plant to be erected by the J. W. Clement Co., 8 Lord Street, Buffalo, estimated to cost $160,000.

The Rome Brass & Copper Co., Rome, N. Y., will erect a new one-story and basement building, 50 x 180 ft., as a Chicago branch, at 16-22 North Ada Street, estimated to cost $55,000. M. K. Williams is manager. Alfred E. Pashley, 431 South Dearborn Street, Chicago, is architect.

The Payne Hardware Co., Fort Street, Ogdensburg, N. Y., is planning the installation of metal-working machinery, motor-driven.

Julius C. Schutz, 1370 Main Street, Buffalo, architect and engineer, is preparing plans for a new one and two-story ice-manufacturing and cold storage plant, 35 x 100 ft., at Rochester, N. Y. The owner's name has not been announced.

A manual training department will be installed in the new school to be erected at Eggertsville, N. Y., estimated to cost $200,000, for which an architect will soon be selected.

The Genesee Light & Power Co., Batavia, N. Y., is planning for extensions in the plant and system of the Western New York Utilities Co., Medina, N. Y., recently acquired. Walter C. Lewis is president.

The Jamestown Metal Desk Co., Blackstone Avenue, Jamestown, N. Y., has awarded contract to Shellberg & Lindquist, Jamestown, for a one-story addition, 100 x 200 ft., estimated to cost $50,000.

Motors, conveying and other equipment will be installed in the new plant, 130 x 202 ft., to be erected by the Addison Lithograph Co., 299 State Street, Rochester, N. Y., for which bids on a general contract will be asked about March 1. S. Firestone, 59 South Avenue, is architect and engineer.

The Standard Turbine Co., Wellsville, N. Y., is planning for the installation of additional equipment. E. C. Brown is treasurer.

G. Fred Calmbach, Buffalo, operating a Ford automobile service and parts works at 1812-16 Niagara Street, has plans for the erection of a one-story addition to the present building, 72 x 100 ft.

The Christian Schlicker Mfg. Co., manufacturer of hardware specialties, surgical instruments and entomological supplies, 12 Bloomingdale Street, Rochester, N. Y., is in the market for a used Miner & Peck drop hammer, 125 to 175 lb., with automatic lifter.

The D'Lyte Co., Inc., Tenth and Diamond Streets, Philadelphia, was recently incorporated under Delaware laws to manufacture phonograph reproducers, having a factory and sufficient facilities for present operations. The officers are: M. J. Del Marmol, president; John Williams, treasurer, and C. J. Del Marmol, general manager.

The Hamburg Boiler Works, Hamburg, Berks County, Pa., has been incorporated with capital stock of $60,000, fully paid, and will take over the business in boilers, stacks, tanks, air receivers, etc., formerly conducted under the same name. The management will remain as before, under Henry Seiders.

Trumbull Steel Co. Report

After charges, taxes and preferred dividends, the Trumbull Steel Co., Warren, Ohio, earned $2.52 per share on common stock in 1922, according to the annual report submitted last week to stockholders by President Jonathan Warner. Shareholders approved a financial reorganization, providing for the issuance of no par value common and increasing the preferred stock authorization from $10,000,000 to $15,000,000.

Production in 1922 reflects a revival of the industry in the Mahoning Valley, as the company shipped 383,746 tons of finished steel, comparing with 136,711 tons in 1921. Gross sales last year were $23,163,726, the price per ton on shipments averaging $65. Total sales in 1921 were $12,851,589.13. In 1922 the company charged against gross earnings $1,683,000 for maintenance and depreciation, increasing this item to over $10,000,000 in the past five years.

The President's report showed current liabilities of $5,247,000 and current assets of $14,492,317. Inventory and bills receivable were approximately $3,500,000 larger than a year ago owing to the larger volume of business. The company's payroll in 1922 was $7,690,000 comparing with $4,285,000 in 1921. Production during January, 1923, was at the annual rate of 450,000 tons, as stated by Mr. Warner. The undivided surplus of the company was increased last year to $8,400,000.

The Walworth Ohio Co.

The February issue of the *Walworth Log*, a house organ of the Walworth Mfg. Co., Boston, manufacturer of valves, fittings, etc., is devoted to the latest acquisition of the Walworth company, the Walworth Ohio Co., which recently succeeded to the business conducted under the name of the Hiram Rivitz Co., Cleveland. S. R. Mitchell has been sent to Cleveland as vice-president and general manager of the new unit. Mr. Mitchell has been for 29 years connected with the company as manager of the Western division, manager of the branch house department and manager of the Kewanee works. William M. Mickleborough becomes financial man of the new unit with title of assistant treasurer. The Walworth Ohio Co. will handle substantially all of the territory in Ohio and Pennsylvania. A complete stock, not only of Walworth valves, fittings and tools, but also of plumbing, heating and factory supplies, will be maintained at the Cleveland warehouse and this stock will be duplicated in less volume at the Youngstown store.

Receiver for Kilbourne & Jacobs Mfg. Co.

Paul T. Norton has been appointed receiver for the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, on application of the Westinghouse Air Brake Co., Pittsburgh, which holds two promissory notes of $11,792 each, while indebtedness to other creditors, including bonded indebtedness, amounts to $1,342,257, and claims amounting to $542,257 will be due before Aug. 1. The Kilbourne & Jacobs Mfg. Co. was incorporated in 1881 and has long been one of the leading industrial concerns of Columbus. A reorganization took place several weeks ago and Mr. Norton was elected president. The late Col. James Kilbourne was president of the company for many years.

Midvale Deficit

The Midvale Steel & Ordnance Co. and subsidiaries report for the last quarter of 1922 a deficit, after charges, taxes, depreciation and depletion, of $4,211. Adding to this the estimated loss in the dissolution of the Consolidated Steel Corporation (export company) of $270,000, the total deficit amounts to $274,211. The report, however, is a large improvement over the third quarter, with a loss of $760,864, also over the last quarter of 1921, which showed a loss of $1,379,782. Earnings for the last quarter of 1922, after provision for all taxes, but before deducting interest on bonds and guaranteed stock and reserves for depreciation and mines depletion, were $2,090,356.

General Motors, Inc., has purchased for $2,000,000 the entire body business and plant of the Milburn Wagon Co., Toledo, Ohio. Under the terms, which include 20 acres of land, the Milburn company will continue to operate for two months to finish work now on hand, and it will retain its electric-car business.

The American Light & Traction Co., for the year ended Dec. 31, 1922, shows a gross income of $29,015,393, an increase over 1921 of $1,744,821. Net earnings were $4,382,550, as against $3,870,901 in the previous year.

Trade Changes

Announcement is made by the Conveyors' Corporation of America, 326 West Madison Street, Chicago, of its acquisition from the Green Engineering Co., East Chicago, Ind, of all rights to the Green steam jet ash conveyor. In connection with the transaction, which was effective Feb. 1, the Green company stated that it would fill orders on its books at that time. All future orders should be sent direct to the Conveyors' Corporation. Hereafter the Green Engineering Co. will concentrate on automatic stokers, ash tanks and pulverized fuel burning equipment.

Burt Harris & Co., Inc., 233 Broadway, New York, has been incorporated with authorized capital of $100,000, and has purchased the scrap yard owned by the Empire State Steel Products Co., at Morris Canal and Grove Street, Jersey City, N. J. This is a well equipped yard having a railroad siding, shears, two derricks, a 250-ton truck scale, and other necessary equipment to handle railroad and industrial scrap. The officers are: Burt Harris, president; M. D. Adelson, vice-president; and E. P. Harris, secretary-treasurer.

The Detroit Air Cooled Car Co., Wayne, Mich., is now situated on the Michigan Central Railroad in the former Swift plant. It has also purchased 10 acres of land at the junction of the Michigan Central and Pere Marquette railroads. Offices have been added to the plant, which has been remodeled, and a heating plant has been installed. W. J. Doughty is president.

The Hanna Engineering Works, Chicago, manufacturer and distributer of Hanna riveting machines, air hoists, sand sifters, Mumford molding machines and the Milwaukee sprue cutter, will be represented in the Detroit district by the Charron Engineering Sales Co., 1002 Real Estate Exchange Building, Detroit.

The H. M. Lane Co., Owen Building, Detroit, has moved its offices to 333 State Street.

The Cummings Machine Works, 110 High Street, Boston, has moved to new quarters at 255 Atlantic Avenue.

With the transfer of the specialty department to its Columbus Avenue plant, a decentralized unit has been formed at the General Electric Co., Pittsfield, Mass., plant. C. C. Abbott will be the executive engineer of the new department, which will comprise all processes and functions of engineering and manufacturing pertaining to sheath wire, heating devices and other apparatus assigned to it.

Purchase of the Imperial Wheel Co., Flint, Mich., by the Haynes Wheel Co., Jackson, Mich., was formally completed Jan. 29. The plant is to be operated for the present under its former name as a unit of the Hayes company, with C. B. Hayes as president, C. N. Bonbright, vice-president, and C. H. Robinson, secretary-treasurer.

The Twin Piston Ring Co. has moved from West Orange, N. J., to 227 High Street, Newark, N. J.

The Standard Conveyor Co. has purchased all rights, titles and patents pertaining to Brown portable elevating, conveying and loading machinery, hitherto manufactured by the Brown Portable Conveying Machinery Co., North Chicago, Ill. The plant will be operated by the Conveyor company and inquiries should be sent to the Brown Portable Products Plant, Standard Conveyor Co., North Chicago. The organization of the Brown Company will continue under the new management.

The Kansas City Bolt & Nut Co., Kansas City, Mo., announces the election of W. L. Allen as president, effective Feb. 1. George T. Cook, who has served for some time as chairman of the board, becomes chairman of the executive committee. Solomon Stoddard, who has been active head of the company as president for a number of years, will be chairman of the board. W. L. Allen has been brought into the company in view of proposed extension of activities. He was recently vice-president and general manager of the Laclede Steel Co., St. Louis, prior to which time he was president of the Valley Steel Co., which was absorbed by the Laclede company in 1918.

The Machinery Dealers, Inc., 453 Chapel Street, New Haven, Conn., dealers in new and used machinery and equipment, successor to the Standard Machinery Co., recently purchased the entire building formerly occupied by the Peck Mfg. Co., at the corner of Chapel and Wallace Streets, New Haven. The property comprises a brick building 55 x 154 ft.; two stories high, which will be used exclusively for salesroom, warehouse and office.

The Solomon-Abbott Co. has changed its name to Abbott, Merkt & Co., Inc., industrial engineers, 175 Fifth Avenue, New York. There will be no change in personnel, except that Col. G. R. Solomon will be active only as a director and stockholder.

Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, pig iron, coke and alloys, announce that James C. Layne, Jr., and Albert E. Scherm, Cincinnati; Joseph G. Walton, Pittsburgh manager, and John Baker, Cleveland, manager, have been admitted as partners in the firm. All four men have been connected with the company practically since its inception and are well known to the trade.

The Oilgear Co., Milwaukee, has opened an office in Detroit at 415 East Jefferson Avenue. Donald Clute, who formerly handled the sale of Oilgear products for the Cadillac Machinery Co., has been placed in charge.

The Morris & Bailey Steel Co., Pittsburgh, has changed its name to the Morris & Bailey Division, Oliver Iron & Steel Corporation.

The New York office of the Reed-Prentice Co. is acting as selling agent for bench lathes and internal grinding machines manufactured by the Rivett Lathe & Grinder Co., Brighton District, Boston. This office is in charge of P. K. Dayton, room 536, 149 Broadway. The Rivett company has had a similar arrangement with the Reed-Prentice Co. in the Detroit territory and has found it satisfactory.

The United States Cast Iron Pipe & Foundry Co. has moved its Dallas sales office from the Scollard Building to the Magnolia Building, Room 617. This office remains in charge of Thomas W. Hanlon.

The electrical manufacturing plant in Bloomfield, N. J., known as the Sprague Electric Works of the General Electric Co., will hereafter be known as the Bloomfield plant of the General Electric Co. This plant, which was formerly the Sprague Electric Co. was acquired by the General Electric in 1902 and is engaged in the manufacture of electric motors, generators, controllers, etc., employing about 1,600 at the present time.

The entire business of the Philadelphia Pin Key Machine Co., has been taken over by the Philadelphia Pin Key Duplicating Co., Inc., 222 South Tenth Street, to whom all invoices of the machine company will be paid. All liabilities of the machine company will be paid by the corporation, which carries a stock of machines, cutters and parts.

Plans of New Companies

The Wisconsin Truck Co., Madison, Wis., recently incorporated with $25,000 capital to manufacture motor trucks, has effected a merger with the Six-Wheel Motor Truck Co., Fox Lake, Wis., and is increasing its capital stock to $150,000. The factory opened at 18 North Charter Street in Madison Jan. 15 will be doubled in size and new equipment is now being purchased. A single order for 500 six-wheeled trucks with four-wheel drive has been booked for delivery to an oil company at Tulsa, Okla., beginning Feb. 15. An output of 800 to 900 chassis in 1923 is assured by present contracts.

The Enterprise Wheel & Car Corporation, Bristol, Tenn., Va., has been organized to continue the business of the Enterprise Foundry & Machine Works in the manufacture of mine car wheels, composite roller bearing trucks and complete mine cars. A foundry is now under construction and plans are being prepared for a new machine shop. The company has not decided whether it will do this work or have it done by contract. The new plant has about an eight-acre inclosure affording 40,000 sq. ft. of floor space and will be devoted exclusively to the manufacture of roller bearing car wheels for mines and industrial railways, and to building mine cars. C. P. Daniel is vice-president and general manager.

The Associated Spring Corporation has been incorporated under New York laws, combining several concerns manufacturing springs for watches, clocks and machines. Fuller F. Barnes of Bristol, Conn., is president. The firms comprising the corporation are: the Allace Barnes Co., Bristol; William D. Gibson Co., Chicago; Raymond Mfg. Co., Corry, Pa.; Barnes-Gibson-Raymond, Inc., Detroit, and Wallace Barnes Co., Ltd., Hamilton, Ont.

The General Service & Engineering Corporation, with general offices at Columbus, Mont., which was recently incorporated with capital stock of $100,000, announces that this stock has been fully subscribed. This corporation will be the directing manager of the Stillwater project, and as such will direct the affairs of the following corporations now being organized: the Mineral Range Holding & Finance Corporation, Nye Consolidated Coal Mines Co., Beartooth Lumber Co., Mineral Range Power Co., Mineral Range Reduction Co., Mineral Range Consolidated Mines Corporation and the Columbus, Mineral Range & Southern Railway Co.

The Walker-LaFrance Motors, 1819 Broadway, New York, is issuing $125,000 ten year 7 per cent debenture bonds which are being taken by an underwriting syndicate and not through the Gotham National Bank as was mentioned in a previous issue. The company manufactures Ward-LaFrance heavy duty motor trucks.

The Davis Radio Co., Keyport, N. J., is manufacturing wireless receiving equipment. J. Burgess Davis is president.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.19c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.19c.
Hoops, base price	5.04c.
Bands, base price	3.99c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.29c.
Channels, angles and tees under 3 in. x ¼ in., base	3.19c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.20c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.40c.
Toe-calk, ½ x ⅜ in. and larger	4.15c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.75c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	4.05c.
Squares, flats and hex	4.55c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.29c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.19c.
No. 12	4.24c.
No. 14	4.29c.
No. 16	4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass. Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.15 to 4.30c.	.....
Nos. 22 and 24	4.20c. to 4.35c.	4.60c.
No. 26	4.25c. to 4.40c.	4.65c.
No. 28	4.35c. to 4.50c.	4.75c.
No. 30	4.60c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.50c. to 4.75c.
Nos. 18 and 20	4.65c. to 4.90c.
Nos. 22 and 24	4.80c. to 5.05c.
No. 26	4.95c. to 5.20c.
No. 27	5.10c. to 5.35c.
No. 28	5.25c. to 5.50c.
No. 30	5.75c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel			*Wrought Iron*		
	Black	Galv.		Black	Galv.
½ in. Butt...	—47	—31	½ in. Butt...	— 4	+19
¾ in. Butt...	—52	—39	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—54	—41	1-1½ in. Butt	—14	+ 6
2½-6 in. Lap.	—50	—37	2 in. Lap....	— 5	+14
7-8 in. Lap...	—47	—20	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap ..	—42	—18	7-12 in. Lap..	— 3	+16

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	20¼c. to 21¼c.
High brass wire	20¾c. to 21¾c.
Brass rods	17½c. to 18½c.
Brass tube, brazed	27¼c. to 28¼c.
Brass tube, seamless	23½c. to 24 c.
Copper tube, seamless	26½c. to 26¾c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Wasters
			80 lb..	$5.80	$5.55
			90 lb..	5.90	5.65
			100 lb..	6.00	5.75
IC..	$10.00	$8.50	IC..	6.15	5.90
IX..	11.50	10.00	IX..	7.15	6.90
IXX..	13.00	11.25	IXX..	8.15	7.90
IXXX..	14.25	12.50	IXXX..	9.15	8.90
IXXXX..	16.00	14.00	IXXXX..	10.15	9.90

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits pig	42c.
Bar	50c. to 55c.

Copper

Lake ingot	16 c.
Electrolytic	15¾c.
Casting	15½c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	10¼c. open 10¾c.

Lead and Solder*

American pig lead	9c. to 9¼c.
Bar lead	12c. to 14c.
Solder, ½ and ½ guaranteed	30½c.
No. 1 solder	29c.
Refined solder	26c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c.
Commercial grade, per lb.	35c.
Grade D, per lb.	25c.

Antimony

Asiatic	8c. to 9c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	27c. to 28c.

Old Metals

The market is strong and quite active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.75
Copper, heavy wire	12.00
Copper, light and bottoms	10.50
Brass, heavy	7.50
Brass, light	6.50
Heavy machine composition	9.75
No. 1 yellow brass turnings	7.00
No. 1 red brass or composition turnings	8.75
Lead, heavy	6.75
Lead, tea	5.00
Zinc	4.50

ESTABLIS

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